2417

QST

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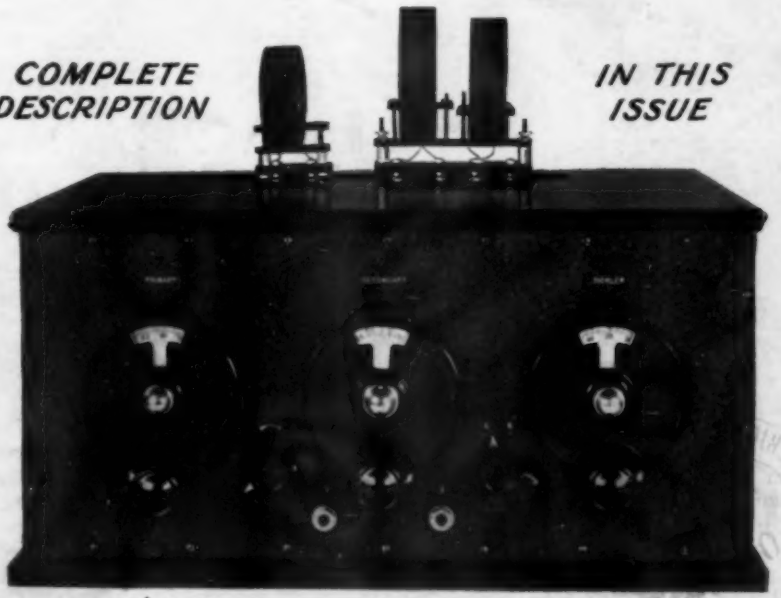
AMATEUR RADIO

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

An All-Wave Receiver!

COMPLETE DESCRIPTION IN THIS ISSUE



Constructional details for building a plug-in-coil tuner efficiently covering all the useful wave-bands from 12 to 20,000 meters.

OCTOBER 1926

25¢

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STANDARD
FOR·ALL·SETS

ALL·TYPES·C·AND·CX
IN·THE·ORANGE
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New York **Chicago** **San Francisco**

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volume
-without forcing

THE man who likes plenty of volume for easy listening usually has to drive the last tube of his set beyond its limit to get the music loud enough. And then it is no longer music. The RCA power Radiotrons are specially made to stand the strain in the last audio stage. They can handle plenty of volume without blasts or rattles, and therefore mean finer, clearer tone!

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INDUCTANCE UNITS

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The Aero Coil Tuned Radio Frequency Kit illustrated above will positively improve the performance of any receiver. Patented Aero Coil Construction eliminates radio frequency losses and brings tremendous improvement to volume, tone and selectivity.

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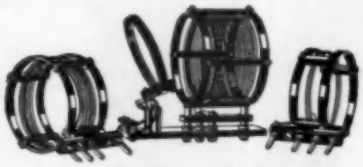
Completely interchangeable. Adapted by experts and amateurs. Range 15 to 130 meters. Includes three coils and base mounting, covering U. S. bands 20, 40 and 80 meters. You can increase the range of this short wave tuner by securing coils No. 4 and 5. Combined range of 25 to 150 meters. Both interchangeable coils fit same base supplied with short wave kit and use the same condensers. Coil No. 4 price $4.00; Coil No. 5 price $4.00.



PRICE $12.50

Aero Interchangeable Coils No. 4 and 5

Increase range of your short wave tuner by securing coil No. 4 and coil No. 5, combined range 125 to 550 meters. Both interchangeable coils fit the same Aero base supplied with the short wave kit, and use the same condensers.

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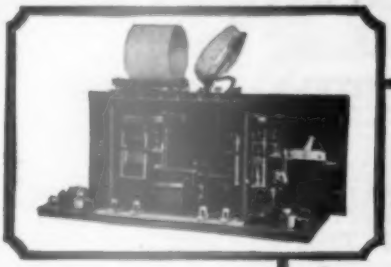
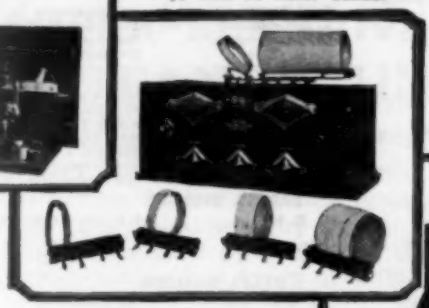
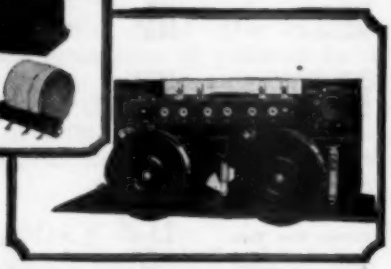
**Active stations in Maryland are requested to report to SCM Layton of Wilmington, Del. until an SCM is elected for the Section.



General view of interior of CR-18



Front view of CR-18 with 200 meter coil intake and additional coils for 10, 20, 40 and 80 meter bands.



Showing coil mounting and Beat Frequency Condenser between dials.

Meets All Amateur Requirements

THE CR-18 was designed especially for the amateur. The rapidly growing demand for this low-wave receiver is proof positive that it is fully satisfying his needs.

The efficiency of the CR-18 is the result of eight Grebe features plus Grebe construction.

An Antenna Coupling Coil provides variable electro-magnetic coupling between antenna and grid circuit. Permits of harmonic tuning to increase signal strength, gives greater selectivity and reduces interference and induction noises.

Losses are reduced to a minimum.

Plug-in Coils allow rapid change from one frequency band to another.

Grebe S-L-F Condensers insure ease of tuning and maximum signal strength.

Beat Frequency Control permits tuning to a fraction of a kilocycle.

Plate Circuit design gives smooth control of regeneration without affecting wavelength calibration and tuning.

Cushion Sockets eliminate microphonic noises.

The six *Self Supporting Air Dielectric Coils* are very rugged, which insures long life.

Write for Booklet Q and charts.

A. H. Grebe & Co., Inc., 109 West 57th Street, New York

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A modern coupled regenerative circuit receiving between 10 and 200 meters (1500 to 30,000 kilocycles)

GREBE RADIO

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All Grebe apparatus is covered by patents granted and pending.

Dieter Tilly

This Company owns and operates stations WAHG and WBOQ; also broadcasting stations, Mobile WGMU and Marine WRMU, and stations 2ZV and 2XE.

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QST

The Official Organ of the A·R·R·L

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F. Cheyney Beekley Managing Editor and Advertising Manager

Robert S. Kruse, Technical Editor
John M. Clayton, Assistant Technical Editor
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THE AMERICAN RADIO RELAY LEAGUE

The American Radio Relay League, Inc., is a non-commercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is non-commercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its Board.

"Of, by and for the amateur", it numbers within its ranks practically every worth-while amateur in the world and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite. Correspondence should be addressed to the Secretary.

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SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST

EDITORIALS

Winter

COMES the Fall", as the movie title-writers would put it. Once again our vacations are over, the harvest moon is here, and there's a zip in the air o' mornings that announces the arrival of the super-DX season of the northern hemisphere. (Imagine writing this kind of stuff in middle August, as we must do to meet our October number. The bromidity today—excuse us, the humidity—is perfectly terrible, and the static was fierce last night. But that's all right—by the time these lines reach your eye, O Gentle Reader, there will be a harvest moon and a zip in the air, and we'll all be feeling the lure of DX again. Then, if not now, we'll know full well that the poets aren't talking to us when they sorrow over the melancholy days of autumn.)

We wish we were good at gazing into this other kind of crystal by which one can read the future. We'd like to be able to imagine what variety of wonders the coming winter season holds in store for us. We've never dared to guess high enough, tho so we decline this time. But we do know that already, counting far removed colonies as separate "countries", there are about sixty different countries on the air, with many more coming, so there is going to be plenty of world-wide DX fishing this winter and lots of sport. And with the various exploring expeditions in out-of-the-way places depending on amateur communication for their contact, there is going to be plenty of interest to keep everybody on their toes.

We offer a few tips. (1) The lower portion of our "40-meter band" is unnecessarily crowded. Why should everybody aim at the lower fringe of that band? Foreign DX men tell us that QSO's would be much better and easier if more fellows would move up into the top half of that band. Try it. (2) Don't overlook the possibilities of 20 meters. All too few are trying it. Many of those who do, complain to us that there aren't enough stations there to keep things interesting. But their DX results are exceptionally fine, which shows that many of us are passing a good bet. (3) By all means stay within your authorized wavebands. When you get over the fence you're in somebody else's pasture and gumming up all the traffic.

Please keep Headquarters posted on new countries worked and on the QRA of new stations that have their first QSO with you, so that we may have the addresses for QSL purposes.

And now to work Atlantis, Mars, Patagonia and Zanzibar!

A Job for the Clubs

WE HAVE commented many times on the fact that there is a large body of radio experimenters who would like to know more about our own brand of amateur radio. We have said that these people possess the necessary ability—that any BCL who can build his own neutrodyne or superheterodyne and make it work can build his own short-wave transmitter and tuner and make them work if only he has a little help. But learning the code is the real stumbling block. We know that it is not so hard; but when one stands on the outside looking in it appears very hard and it takes considerable courage to make the plunge. That is the real difficulty: making the plunge. After one is in, as we all know from experience, progress is rapid and sure. It looks, then, as if one of the most important things we could do to help the big group of fine prospective amateurs in the offing is to lend a hand in this matter of learning the code. To this end we'd like to suggest that it would be a very splendid thing if our numerous clubs thruout the country would start free code classes.

An example of what can be done in that direction is occurring here in Hartford where one of the newspapers is running a free code class under the direction of a capable amateur. A class of 120 BCLs is meeting twice a week. Their average age is 35 years

and most of them are capable of becoming fine amateurs. They have the maturity of viewpoint that comes with years, and they have a greater measure of financial independence than the average amateur of the past has had. They ought to be encouraged for the good of the art. Altho some of them are just learning the code out of curiosity, eighty percent of them say that they intend to own amateur stations soon. Of course not all of the eighty percent will, but nonetheless a very worthwhile addition to amateur ranks is certain to result. And are they progressing? By the end of the third lesson, when they had learned half of the letters of the alphabet, most of the class was copying simple words made up of letters in the half of the alphabet they knew, at the rate of eight words a minute!

This isn't the first free code class ever held —many of our clubs have managed them in the past—but its success and the appreciation shown for it are typical. And here's the point: the need for this kind of service is greater than ever before, and early autumn will be the ideal time for starting it, so that the graduates may have a full winter's season of opportunity before them. We know nothing so valuable that our affiliated clubs might do right now to help Amateur Radio. We commend the idea to the officers of all these clubs. How about it, Clubs?

Our Handbook

AT last we have the honor of announcing "The Radio Amateur's Handbook", the *A.R.R.L.* handbook we have been dreaming about for several years. It has been a long time coming, for it has been produced by the staff at Headquarters and it had to be worked on along with our other duties in days already crowded. A strenuous effort has been made to present it for the opening of the winter DX season, and here it is.

The book has been written by Mr. F. E. Handy, A.R.R.L. Communications Manager, eminently qualified for the job not only because of his sound engineering knowledge but perhaps more particularly because this business of actually operating amateur stations is the subject with which his department deals daily and he knows it inside out. The Handbook has been designed to be of equal interest to the beginning amateur, the average amateur, and the past master at the game. For the beginner it starts at the beginning and tells what amateur radio is, what the League is, why it is and how it works, how to become a transmitting amateur, how to operate, and how to build a station. For the amateur already arrived it is both a manual on amateur practice and a textbook on amateur construction and operation, describing the building of transmitting and receiving apparatus and their numerous accessories with enough "theory" to understand the "why" of everything in the amateur station.

We are justifiably proud of our Handbook. We believe it will be of the greatest value to everyone with even the remotest interest in the fascinating hobby of amateur radio. Further particulars will be found in the advertising section of this issue.

The Fieldman's Trip

ARTHUR A. HEBERT, the League's treasurer, is a man of many titles and duties. Among his titles is that of "Fieldman", the League's traveling contact representative with the membership. The Executive Committee has just authorized another trip around the country by Mr. Hebert. In the latter part of September he will leave Hartford on a 12,000-mile trip, not returning to his desk here until early December. First he goes all the way across Canada to Vancouver, down the West Coast, then thru the southwestern, central and southern states, and home again.

During this ten-weeks' trip Mr. Hebert will meet many thousands of our members, at conventions, ham-fests, little local gatherings, individual visits. Meetings are being arranged along his itinerary by the local Communications officials, and your local official will know if he is coming to your town. He wants to meet as many of you as possible, to tell you the story of the League, to answer your questions. Save up your troubles, too, and tell them to him; if there are any that he can't unravel on the spot he will bring them back to the Executive Committee. We have found these contact trips between Headquarters and the membership one of the most helpful things imaginable in keeping A.R.R.L. the smooth-running organization it is, and we hope this trip will be equally successful. Don't miss meeting "Hebie".

K. B. W.

Covering All Wavelengths

By John M. Clayton, Asst. Technical Editor

ALTHOUGH the tendency nowadays to use shorter and shorter wavelengths in all radio communication is a very marked one, it is far from true that the majority of stations is operating on wavelengths below 200 meters. There are more stations in regular operation above 200 meters (and out of the broadcasting band, too) than there ever were. No amateur station can be said to be really complete unless its receiving equipment is designed to take in all wavelengths in which radio communication is going on. Old-Timer, as well as beginner will find that there is a lot of fun awaiting him from listening to telegraph work on wavelengths of 600 meters and up.

It has been necessary, in the past, to use at least three, and sometimes four, complete receivers to cover the wavelengths between 15 and 19,000 meters. Such an array of receiving apparatus is disappointing. In addition to requiring the expenditure of a considerable amount of money, the receivers must be spread out all over the operating table where it is inconvenient to tune them, and each receiver requires its detector and amplifier, or a common amplifier which can be cut in on individual detector circuits. The latter layout begins to get complicated and very inconvenient.

With all this in mind, the job of building a single all-wave receiver by means of which all of the *useful* radio frequencies could be covered, was undertaken. Obviously, in covering such an enormous range it is going to be necessary to change inductances rather often. We have our plug-in short wave systems, and for work on wavelengths above 1,000 meters, honeycomb coils minus their mud bases are far from hopeless. The plug-in arrangement is as good as any, and certainly a lot more convenient than any method I know of. If the "plugs" and "jacks" are mounted with good spacing between them and on material other than that of the street-paving variety the losses incurred in such a system should be inconsequential.

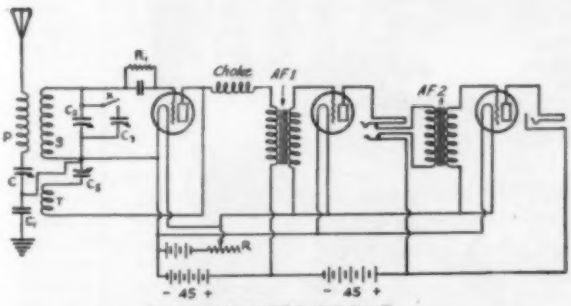
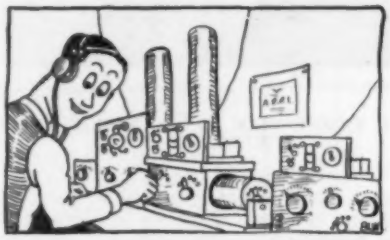


FIG 1 COMPLETE CIRCUIT

It is also quite obvious that the same tuning condenser in the secondary circuit is going to be hopelessly out of proportion at opposite ends of the wavelength spectrum. A 125-μμfd. tuning condenser is o.k. for the



"SUCH AN ARRAY OF RECEIVING APPARATUS—"

20-, 40- and 80-meter bands, and even up to 600 meters, but at 4,000 meters this condenser becomes a good vernier device and at 15,000 meters it is even too small to use as a beat note control! Conversely a 625-μμfd. tuning condenser is o.k. down to and even through the broadcasting band but at 20, 40 and 60 meters it is out of the question.

There are several methods by means of which the condenser problem can be solved satisfactorily. Probably the easiest consists in the use of a tandem condenser, one section of which has the necessary short wave capacity, and the other section, when combined with the first, has the required long wave capacity. The point of transition from short wave to long wave capacity is not a very definite one. From the standpoint of ease of tuning and covering the bands quickly it probably lies somewhere in the vicinity of 700 or 800 meters. Given a tandem condenser with short-and long-wave capacity it merely becomes necessary to provide a simple loss-less switching arrangement to cut in the required capacity, and that problem has been solved.

The Circuit

There is nothing unusual about the circuit. It is the familiar series condenser regeneration control affair first shown in this country by Weagant in his so-called "X"

circuit. Two stages of audio frequency amplification are used, one stage being in use all of the time for the shorter waves and an additional stage when long wave reception over DX ranges is desired. The additional stage is not required in short wave work but the second stage is a great help when receiving 600 meters and long waves on a small antenna. If the antenna is a long single wire, a single stage will give all the headset volume one wants. A 1,500-

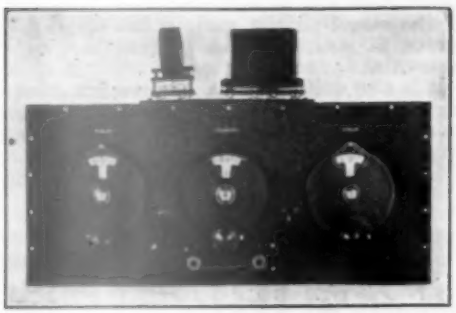


FIG. 2 FRONT VIEW OF RECEIVER WITH 600 METER COILS

μμfd. series antenna condenser (C) is provided for tuning the antenna circuit. A smaller condenser may be used here but unless the receiving antenna is at least 250 feet long the 1,500-μμfd. condenser is required. A smaller condenser will necessitate a correspondingly increased number of primary coils on the long waves. Condenser C1 is a 1-μfd., "blocking" condenser not needed in this receiver but shown in case radio amplification is to be added ahead of the detector. The secondary S is tuned by means of the tandem condenser, one section of which has a maximum capacity of 125 μμfd. and the other section a capacity of 500 μμfd. The C2 (125 μμfd.) section is connected permanently across the secondary, C3 being cut in parallel on the higher waves by means of switch X.

Regeneration is controlled by means of condenser C5, having a maximum capacity of 500 μμfd. A capacity of this size is perfectly o.k. throughout *all* wavebands. In the amateur bands the use of a 500-μμfd. regeneration condenser is a distinct advantage since it requires a small tickler having few turns, causing less detuning of the secondary circuit.

A word of caution regarding the choke coil is not amiss. If a resistance is used in place of the choke, it will be necessary to change it as the wavelength of the receiver jumps from the hambands into the medium and long waves. If, on the other hand, a choke coil of the proper size is used, the regeneration control will be smooth in the hambands and in the broadcast range. Somewhere in the neighborhood of 600 meters the choke does not come into the ar-

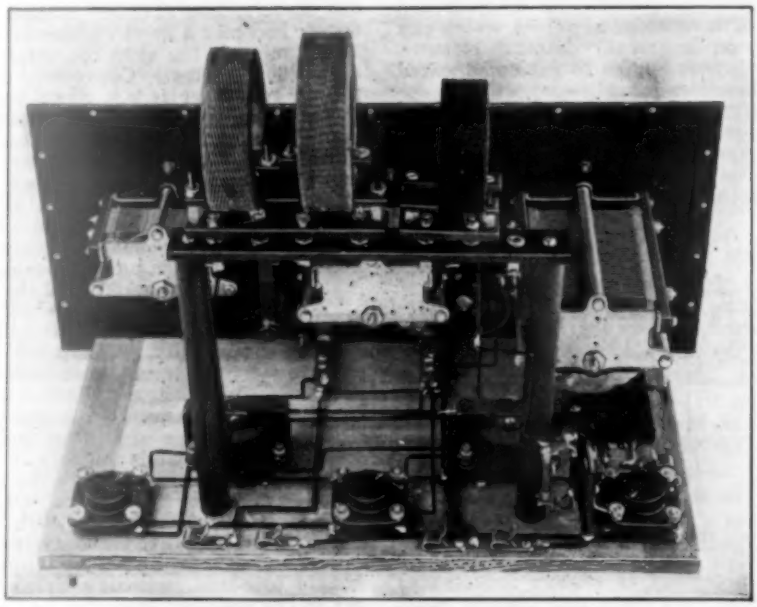


FIG. 3 REAR VIEW OF RECEIVER WITH LONG WAVE COILS

gument at all, the impedance of the primary of the amplifying transformer serving the purpose admirably. All we need to worry about, then, is the *short wave* action of the choke. The secondary of an old intermediate frequency amplifying transformer, stripped of some of its turns, works out entirely satisfactorily for use on *all* wavelengths.

The grid condenser C4 is a compromise between low capacity for short waves and higher capacity for longer ones. It has a capacity of 150 μμfd. For spark reception on 600 meters this capacity is about the minimum, the signal strength dropping off if a smaller capacity is used. For C. W. reception, however, the grid condenser with a 50-μμfd. capacity seems to give as good signal strength on the long waves as a 250-μμfd. condenser does. The grid leak should have a resistance between 5 and 10 megohms, depending upon the type of tube and detector plate voltage.

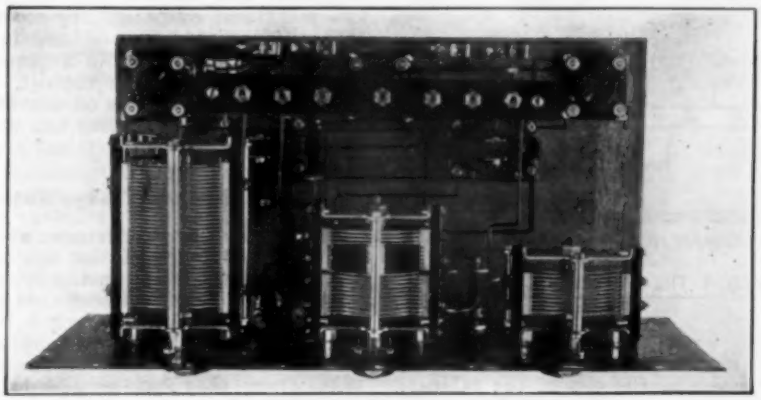


FIG. 4 TOP VIEW. NOTE TERMINAL STRIP FOR PLUG-IN COILS

The Receiver Layout

It was the writer's original intention to build the receiver in a completely shielded cabinet, mounting the coils inside. A little thought, though, brought the conclusion that the receiver itself would have to be quite large to accommodate the coils and give plenty of clearance, and also the idea of having to open the lid of the cabinet, stand up and plug in coils and then close the lid when going from one wave band to another did not seem particularly appealing. Consequently the coils were arranged to plug in to jacks mounted on a strip which projects through the top of the cabinet. Yes, a direct steal from the excellent Grebe CR 18 short wave receiver. With the coils mounted outside of the cabinet there is nothing to be gained by shielding the cabinet. Probably shielding would help very little on the longer waves, anyway. It is a good idea, though, to use a metal (aluminum) panel. All chances of disturbing body capacity effects are eliminated forever. The aluminum is much easier to work than bakelite or hard rubber and with the finish shown in the photographs the appearance of the complete receiver is greatly enhanced.

In Fig. 2 is shown a front view of the receiver. From left to right the dials control primary series condenser (C), secondary tuning condenser (C2-C3) and regeneration control condenser C5. The small knob between the first two dials is attached to the rheostat, R, which is a 6-ohm General Radio type 301. The knob between the last two condenser dials is attached to the condenser switch "X". This switch will be described in detail further on. The jacks are in the first and second audio frequency stages. As the panel is connected to the negative terminal of the B battery it is necessary to insulate the jack frames from the panel. This is done by means of a piece of quarter-inch bakelite strip to which the jacks are attached. The bakelite is held against the rear of the panel, the heads of the jacks protruding through oversize holes cut in the panel.

A detailed panel layout and list of parts are not required. The average person will use the parts he has on hand. Suffice to say that the panel is 8 inches high, 18½ inches long and 1/16 inch thick, and is of aluminum. A piece of aluminum this size can be purchased from almost any tinsmith for about six bits. After *all* of the holes have been drilled in the panel, the very pretty crystalline finish can be put on by the General Radio Company of Cambridge, Mass. Unfortunately this finish is not a home-brew process. It requires very accurate adjustment and maintenance of temperature in the oven in which the panel and varnish are baked. General Radio is prepared to

finish any size metal up to a piece almost as large as a Ford at very modest prices.

The dials shown in Fig. 2 are National variable ratio type, the center dial being one of their latest models provided with a lamp for illuminating the scale. A variable ratio dial is very handy since the same control of rotation is not desirable on all wavelengths.

In Fig. 3 appears a rear view of the receiver. It will be noted that the plug-in strip for the coils is supported by two bakelite rods which, in this case, are ¾ inch in diameter. The exact length of these rods will depend upon the thickness of your baseboard and height of your panel. With the

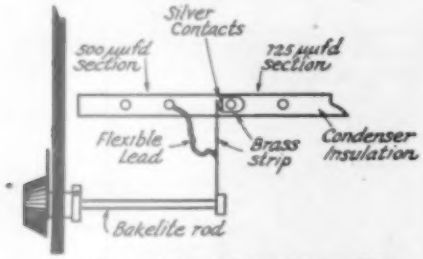


FIG. 5 THE CAPACITY SWITCH

strip in place on top of the supporting rods, the top of the strip should be about flush with the outside of the top of the cabinet. Three sockets are mounted in a line at the rear of the baseboard, and the two transformers are mounted behind the pillars.

Figure 4 shows a top view of the receiver. The condenser at the left is the 1,500-μμfd. antenna series condenser and is a Cardwell type 176-C. In the middle is the split condenser, formerly a Cardwell 156-B, each section of which originally had a capacity of 500 μμfd. One section was ripped down to have four stator and three rotor plates, the resulting capacity being about 125 μμfd. The Cardwell people have just brought out a condenser just for this work. It is shown in Fig. 7 and is known as their type 200-D. Its sections have capacities of 150- and 500-μμfd. respectively. It is supplied with or without a metal shield between sections. The shielded type is to be preferred. The condenser at the right is a 500-μμfd. Cardwell type 123-B.

The plug-in terminal strip shown in the rear of Fig. 4 bears some examination. Starting from *right* to *left* the first terminal jack is connected to the plate of the detector tube; the second jack goes to the stator plates of the regeneration condenser; the third jack is the filament end of the secondary coil, and the fourth jack is the grid terminal of the secondary. As the secondaries and ticklers are mounted as a unit, to prevent inserting the coils in a reversed manner the grid jack is spaced from the filament circuit jack a little further than the spacing between the others. One and three quarters inch from the grid terminal one of the antenna coil jacks is mounted. An inch to the left is the "ground" jack, connected to the stator plates of the antenna series condenser, and an inch further along (the last jack at the left) is another antenna terminal, the two antenna jacks being connected to each other. If the antenna coils are mounted "off center", in their supporting strips, four combinations of antenna coupling can be obtained. Two degrees of coupling are secured when the antenna coil is plugged into the 1st and 2nd jacks and the 2nd and 3rd jacks, and two additional couplings are secured when the coil is turned around and inserted in in a reverse direction. No antenna binding post is provided in the cabinet. The antenna lead-in terminates on one of the G-R plugs and is plugged into the unused antenna jack on the coil terminal strip.

The Capacity Change Switch

Between the two condensers at the right of Fig. 4 you can make out the outlines of the switch used to cut in the 500-μμfd. section of the middle condenser. At the outset let it be said that if this switch is to introduce any losses whatsoever by all means these losses should occur on the long wave side, where they can be added to the already great losses inherent in the larger receiving coils. If the switch introduces any loss or requires any additional wiring or dead-ends on the short wave side, the short wave part of the receiver may be spoiled.

Through the panel a hole large enough to accommodate a bushing from an old switch is drilled. (See. Figs. 4 and 5.) This bushing should have a hole a quarter of an inch in diameter, and should be fitted with a lock nut. Through the bushing hole a length of quarter-inch bakelite rod is passed. The panel end of this rod carries a small G-R rheostat type knob. Back of the panel and against the bushing a collar with set screw (also from a G-R rheostat) is attached. Between the collar and the bushing a spring washer is placed, the collar pressing tightly against the washer. The proper tension and "feel" to the switch is secured by the proper position of the washer. At the other end of the bakelite rod another bushing (from still another rheostat) is placed. To this bushing a piece of brass strip a quarter of an inch wide is soldered. The strip should be long enough, and should be so placed on the rod, to come within a quarter of an inch of one of the supporting screws on the 125-μμfd. section of the tuning condenser. Under the bolts of this screw a short right angle piece of spring material is placed. This spring has

a piece of silver soldered to it. Another hunk of silver is soldered to the "arm" of the switch at that point at which contact is made with the first piece of silver. Comment is lacking from whence the silver came. By bending the switch arm back and forth a few times it will be possible to find the position in which the switch contacts rub in good electrical contact when the arm is turned. Note that when the switch is open the only thing that has been added to the short wave side of the receiver is a piece of brass angle a quarter of an inch long. A flexible lead is connected to the switch arm and one of the supporting screws on the 500-μfd. section. Repeated tests have failed to show any audible losses in the switch on the long wave side.

The Coils

Short wave plug-in coils for all wavelengths from 15 to 550 meters are available from a number of radio manufacturers. These coils are of such excellent construction and so reasonably priced it hardly pays to try to make them yourself. If you want to build your own, however, the Hammarlund three inch coils wound with number 16 S.C.C. wire, 10 turns to the inch can be cut up into primaries and secondaries of the proper size. For reference, secondary and tickler turns are given in the table below. The above Hammarlund coil we have arbitrarily called No. 1. Also we have called their 3-inch coils wound with No. 24 S.C.C. wire (43 turns to the inch) No. 2.

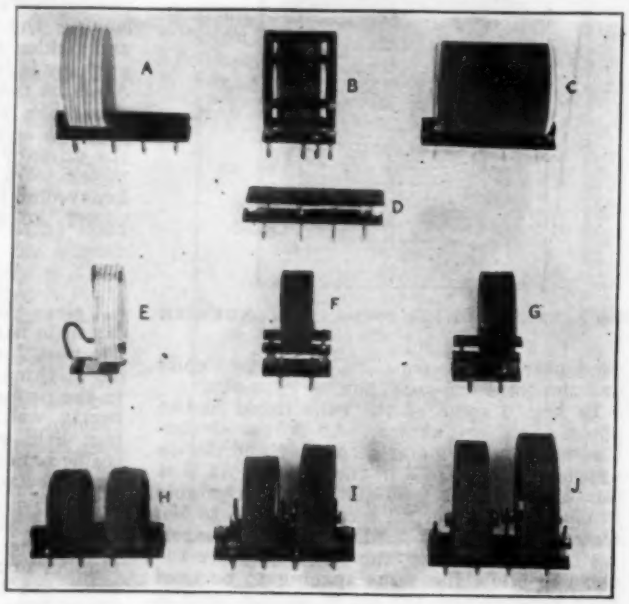


FIG. 6 SOME OF THE PLUG-IN COILS DESCRIBED IN TEXT

All of the coils are mounted with secondary and tickler in the same strip. The primaries are mounted on separate strips. The construction of the coil mountings can be seen from a glance at Fig. 6. The base on which the plugs are mounted is of quarter-inch bakelite, ¾ inch wide and 4½ inches long. The spacers supporting the two narrow clamping strips are Cardwell condenser mounting pillars, being known as their part No. 4741. The short wave coils are clamped between two pieces of 3/16 inch bakelite ⅜ inch wide and 4½ inches long. The long wave coils (honeycombs) are supported in the same manner except that separate top strips are used on each coil to take care of the different thicknesses of the coils.

In all cases the correct primary coil will depend upon the size of your antenna and the size of the primary series condenser. The above primary coils can be used with their respective secondary units when the antenna has a total length of at least 135 feet. An antenna at least 250 feet long is strongly recommended for all reception above 200 meters. If a very long antenna is used, half the number of primary coils

Table of Coils

Unit No.	Pri. Turns	Sec.	Tickler	Tuning Capacity	Range in Meters	Type of Coil
1	7	4	3	125 μμfd.	15-32	Hammarlund No. 1
2	7	6	"	"	31-55	"
3	7	17	5	"	50-105	"
4	7	49	18	"	105-210	"
5	15-25	45	19	625 μμfd.	200-550	Hammarlund No. 2
6	150-200	150	75	125 μμfd.	550-690	Honeycombs
"	"	"	"	625 μμfd.	590-1,600	"
7	"	40	40	(approximately same as No 6)		Hammarlund No. 2
8	400-600	400	200	625	1,500-4,500	Honeycombs
9	750-1,000	1,000	400	" μμfd.	4,000-14,000	"
10	1,000-1,500	1,500	600	"	6,000-18,000	"

will be required.

The broadcast band can be covered quite nicely by using two Aero Products broadcast plug-in coils with the 125-μμfd. tuning

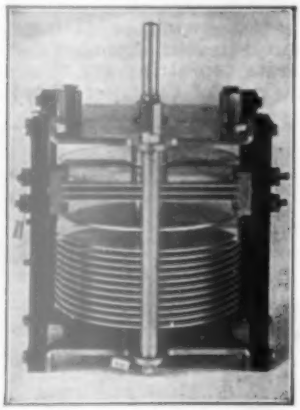


FIG 7 THE CARDWELL 200-D DUAL CONDENSER

condenser, or the smaller of the two coils and the total 625-μμfd. tuning capacity.

In Fig. 6 some of the coils listed in the above table are shown. At A, the Grebe-Hammarlund 40-meter secondary and tickler appears (Unit No. 2 in the table). At B is the Aero Products 80-meter coil, available in plug-in style for all waves from 15 to 550 meters with a 125-μμfd. tuning condenser. As the terminals on the Aero coils are too close to allow the same spacing to be used with honeycombs, the set mounting strip is layed out for the honeycombs, and the short wave coils (if not home-made) are fitted to the mounting strip by means of an adapter such as that shown at D. This adapter is for the Aero coils. The adapter is plugged into the receiver and the coils in the adapter. At C appears the Hammarlund type of coil for 590-1600-meter reception (No. 7 in the table). The tickler for this coil fits inside of the filament end of the secondary. This coil is head and heels above the corresponding honeycomb arrangement shown at H of Fig. 6. At E is the 7-turn short wave primary coil; F shows a 150-turn honeycomb primary mounting and G is a 600-turn coil of the same type. The three groups at the bottom (H, I and J) are honeycomb secondaries and ticklers for all waves between 590 and 14,000 meters (Units Nos. 7, 8 and 9 in the table). The largest secondary-tickler is missing from the photo.

Operating the Receiver

The short-wave side of the receiver is operated in a manner similar to any other short wave receiver except that when time is taken to tune the primary to the received wave or a harmonic thereof the signal strength is greatly increased. The 1,500-μμfd. primary condenser will allow you to use harmonic tuning in the primary circuit no matter what size antenna you are using.

On broadcast waves and especially at 600 meters and up, the set is tuned in the following manner; first the correct primary and secondary coils (from the table) are plugged in and the secondary is tuned by varying both secondary and tickler condensers until the desired signal has been picked up. Then, leaving the secondary alone, the *primary* and tickler condensers are varied until the primary is in resonance with the secondary. A slight readjustment of secondary tuning may then be necessary, especially if the original secondary tuning was done with the primary circuit way off tune. For 600-meter work the Hammarlund coils plus a honeycomb primary make the best spark receiver the writer has ever monkeyed with.

Who's Who

Unless you have kept track of communication in bands other than the ham ones for the past few years you may miss out on a lot of things because you are not listening in the proper place. The broadcast band is pretty well known. Ship calling, answering, SOS work and messages relating to traffic handling occur on 600 meters. Actual traffic between smaller ships and land occurs on 660, 731 and 874 meters. The radio compass wave is still 800 meters. On 952 meters the government has a wave where a number of naval vessels and naval land stations can be heard batting them off hour after hour. Radio beacons (those things making bunches of dashes and never signing) are found on 1,000 meters. Then come the intermediate waves where high power land stations work high power ships. These waves are around 1052, and 1578 to 2499 meters. In this band will be found the high power tube stations WCC, WSH, WAX, KPH and so on, working the large liners. Another band from 2499 to 3156 finds only government stations, among them being the ever faithful NAA on time ticks, weather, hydrographic information and press. NAA's time still comes off at 10 P.M. (E.S.T.) followed by an hour of weather and press starting around 11 P.M. NSS sends time at the same time as NAA and follows this immediately (usually) with press. Lately NKF has been sending time ticks with the rest on 74 meters although it is understood that this is an experimental time service and may be discontinued. At around 11:15 P.M. WSA sends press on 650 meters, spark, and WSH on about 2400 C. W., both stations being keyed from the same source. On 2200 meters WCC sends press at 9 A.M., 5 P.M. and at 12:18 A.M. WRQ starts his press on 13585 meters.

These are only a very very few of the hun-

dreds of stations operating regularly on waves between 600 and 18,000 meters. After you have listened in on these waves for a little while you will find there is a great kick to be had from jumping from one station to another. The 600-meter kick alone is worth the candle!

Central Division Convention (Ohio State)

CAN anyone imagine a big amusement park being thrown open to radio amateurs and every form of amusements free of charge to all members of the A.R.R.L. —the "Open Sesame" being the League emblem stamped in red on the back of one's right hand. This is no dream fellows, but it came to pass at the 5th Annual Ohio State Convention at Cleveland, on August 20-21, when Mr. Harvey Humphrey, 8 APY, owner and manager of Euclid Beach Park, literally turned the place over to the "gang" all Saturday.

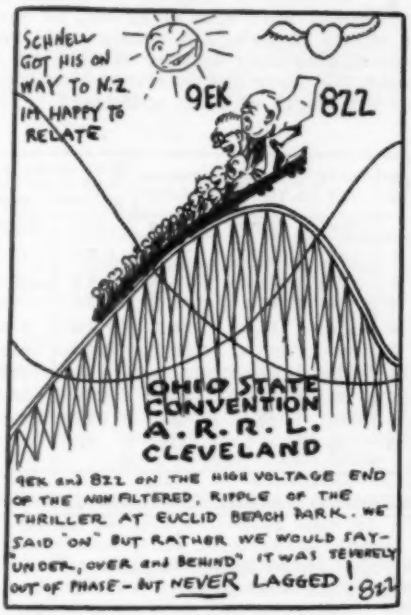
Bright and early Friday morning, delegates from all over the state began to arrive and by two o'clock the register showed an attendance of 125 including a number from adjoining states. 5AQM from Little Rock, Ark. came from the farthest point until just before the banquet when Alberto Lopez of Caracas, Venezuela, made an appearance.

Just as had been announced, this was a convention in which AMUSEMENT was the foreword and the convention committee certainly kept its word, and with the exception of the traffic meeting conducted by Storck, 8 BYN, the new Section Communications Manager, and the open technical meeting with Thatcher, 8 ZE, and Crossley of 8XE in charge, there was nothing but fraternalism existing.

Fred Schnell, former T. M., Director Darr and Hebert, A.R.R.L. Treasurer, had the dream of their childhood days come true when they were able to spend a whole day on the merry-go-rounds, toboggans, etc., "free-for-nothing." From the way the rest of the fellows took advantage of everything it must have been the ambition of everybody.

There were athletic events of all sorts, and Tom Cunningham showed himself a real Sports Manager. Of greatest interest was the ball-game between the visitors and the Cleveland boys with Cleveland winning 1 to 0 and making the most hits.

The banquet was held at the Park and 8 APY's chef certanly knows how to cook a dinner for a hungry lot of brass-pounders. The speakers of the evening were Fred Schnell of the C. F. Burgess Laboratories who gave an interesting illustrated lecture of his NRRL trip; A. A. Hebert, of Headquarters, spoke about Headquarters' Staff and its daily routine; E. E. Horine of the National Carbon Co. spoke in a humorous vein and showed that he is quite a "bug". After the events of the evening everybody


SCHNELL GOT HIS ON WAY TO N.Z. I'M HAPPY TO RELATE
9EK
8ZZ
OHIO STATE CONVENTION A.R.R.L. CLEVELAND
9EK and 8ZZ ON THE HIGH VOLTAGE END OF THE NON FILTERED, RIPPLE OF THE THRILLER AT EUCLID BEACH PARK. WE SAID "ON" BUT RATHER WE WOULD SAY- "UNDER, OVER and BEHIND" IT WAS TERRIBLY OUT OF PHASE - BUT NEVER LAGGED!
8ZZ

returned to the Hotel Winton where a midnight supper was served; the distribution of prizes made, and an initiation into the R.O.W.H. staged.

Great credit is due the Cleveland Wireless Associaation, the Cleveland Radio Amateur Ass'n, J. P. Turner and N. H. Gimmy, Chairman, for the success of the convention. And last but not least to 8APY for so unselfishly extending the hospitality of his park.

It is impossible to give the names of manufacturers and dealers who contributed so many valuable prizes but we wish to publicly thank them for their cooperation.

In the words of the "young squirt" it was THE best convention ever.

YOUNGSTOWN was chosen for next year's convention.

—*A. A. H.*

Strays

A complete list of call letters of all Canadian hams can be obtained for twenty-five cents from Department of Marine and Fisheries, Ottawa, Canada.

The Length of the Hertz Antenna

By G. Wm. Lang*

HOW long should a 40-meter Hertzian antenna be?

Methods of coupling to linear antennas have been described, as have their effects in polarized transmission and reception, also their manner of working at ½ wave, full wave and otherwise—but what about the length of these antennas? The writer has found amateurs putting them up purely by guesswork and then resorting to series condensers and coils to get the antenna into resonance with the transmitter. In such cases the antenna is not being worked at the fundamental (and at this time we are inclined to think of that as being the most favorable operating condition).

ANT NO	WIRE LENGTH TIP TO TIP		FUNDAMENTAL WAVELENGTH	K BY WHICH λ IS MULTIPLIED TO GET WIRE LENGTH		SHAPE
	Feet	Meters	Meters	Feet	Meters	
1	30	9.1	21 3	1.409	.4275	I
2	31	9.4	22.0	1.410	.4275	/
3	44	12.5	28.0	1.57	.4460	—
4	56	17 1	39.5	1.418	.4300	⌐
5	61	18.6	43.0	1.415	.4320	L
6	76	23.1	51.5	1.47	.4480	—
7	57.5	17.5 *plus*	40.0	1.435	.4380	—
8	110.	33.5	78.0	1.410	.4300	L
9	55	16.7	37.0	1.465	.4450	—

TABLE SHOWING MEASUREMENTS MADE AND CONSTANTS FOR EACH ANTENNA

At 1KA the writer tested various Hertz antennas. He also tested the Hertz antennas at 1CK and 1KF. Some were vertical, some were horizontal, and still others had vertical and horizontal sections but all were Hertzian antennas.[1] From these experiments some interesting results were obtained, the most important of which was the formula for determining the length of the Hertzian antenna for a given wavelength.

The antennas were first measured from tip to tip—end of c.p. to end of antenna. The fundamental wavelength was then found with the aid of an oscillator and wavemeter. We find that for horizontal antennas the wire length in feet is 1.46 times the fundamental wavelength in meters and for vertical antennas the wire length in feet is 1.40 times the wavelength in meters. Thus if we wish to operate at 40 meters with a horizontal antenna we multiply 40 by 1.46 and get 58.5 feet as the length of the necessary system[2].

Antenna No. 3 was not used in getting an average for the horizontal group. The reason is that this was a wire laid on the floor. Right beneath this floor were five water pipes in active service. I think this justifies omitting it from the group.

These constants have been applied to numerous antennas and an error of less than 5% resulted. Try it and let *QST* know of the result.

The table also shows tests on antennas of other forms and the constants for those are seen to fall between the H and V types, showing that the constant varies with the angle between the wires and ground.

* Department of Radio Operations, Radio Station WBZ, Hotel Brunswick, Boston, Massachusetts.

1. As has been said before in *QST*—there is room for argument as to the proper definition of "Hertzian antenna". Personally I am inclined to Mr. Lang's view that any antenna is Hertzian when the c.p. and the antenna are more or less alike and the system is operated ungrounded. However it is perfectly possible to argue that only straight-line antennas are really Hertzian. Tech. Ed.

2. For those of us who own meter sticks and don't want to think in two sorts of units the constants become .44 for horizontal antennas and .43 for vertical antennas. It seems a great pity that we must tolerate this double standard in radio. Tech. Ed.

3. Some other variable seems involved also. Westman and Clayton on p. 46 of *QST* for May, 1926 gave results for bent antenna systems in which the constant was almost exactly 1.5 (.456 for the metric system). This was for the usual form of antenna in which the c.p. is horizontal and underneath a horizontal antenna, both extending in the same direction from the station. Tech. Ed.

Strays

At the June meeting of the Institute of Radio Engineers held in New York City, Dr. Greenleaf W. Pickard was awarded the 1926 Institute Medal of Honor for his contributions to the radio art, and particularly as recognition in the pioneering work done by Dr. Pickard in the field of crystal detectors, coil antennas, wave propagation and atmospheric disturbances. Our heartiest congrats to a man whom there is no more deserving of such honor.

Bartholomew of pr4SA was in the H. Q. office recently after a tour of these United States and a trip to Vancouver, B. C.

Additions to the number of crystal-controlled stations are as follows: 1CK, 4TR, 9CDT, 2DS, 2BRB and 2MU.

Cheap Measuring Instruments

By Walter T. Lang*

THE amateur experimenter often has a need for electrical measuring instruments of various ranges, yet does not have available the means to purchase them. The following discussion shows how any experimenter may use for a number of purposes, not requiring an exceptional degree of accuracy, a simple pocket volt-ammeter, costing in the neighborhood of a dollar. A "Sterling" instrument was used by the writer. These meters have both ammeter and voltmeter scales. The voltmeter portion of the instrument only, in conjunction with auxiliary apparatus, is used for the purposes outlined.

Voltmeters

To increase the range of the voltmeter from 0-10v to 0-80v is a simple matter, requiring only the use of a series resistance, Fig. 1. For this purpose a 50-watt

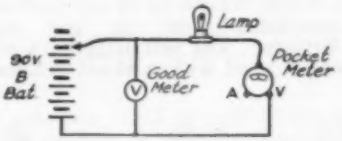


FIG. 1 VOLTMETER AND MULTIPLIER

Edison Gem' carbon lamp gave satisfactory results, allowing a deflection of 6.5 on a source of 50 volts.

The value for the resistance of a 50-watt Edison Gem was personally obtained by the writer, and has been checked with different specimens. It should be remembered that the Gem lamp, although having a carbon filament, has an increase of resistance with an increase of temperature. A suggestion to get constant resistance, as yet untried by the writer is to use a 25-watt grey carbon, and a 25-watt Gem in shunt, the rising characteristic of one being depended on to compensate the dropping of the other.

The best way to calibrate the instrument is to borrow a good meter of approximately the range desired and take the reading of the pocket meter with resistance connected against the reading of the borrowed meter at the various voltages obtainable with a variable "B" battery.

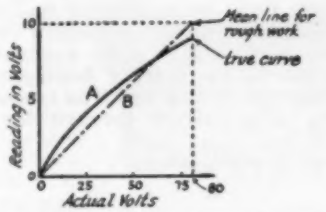


FIG. 2 REMEMBER THIS IS ONLY A SAMPLE CURVE. IT WILL NOT FIT YOUR METER

If it is not possible to borrow such an instrument a very rough calibration may be made as follows. Purchase a new B battery and have the voltage across the various taps tested with a good voltmeter. Record all these readings. The home-connected meter should be calibrated across these same taps as soon after as possible, and should be left connected only as long as it is necessary for an accurate reading as the device consumes considerable current, and may cause a drop in battery voltage if left on too long.

In either of the above two cases it is advisable to plot a curve as (due to the fact that change in temperature of the lamp-filament causes a change in resistance) the factor of proportionality is not absolutely

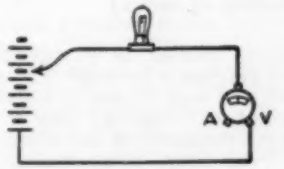


FIG. 3

constant. The curve will droop slightly at the higher readings being shaped somewhat as Fig. 2A.

For rough work, a straight line can be drawn, approximating the curve quite closely, then for rough work we can use a multiplying constant gotten as follows. On line B (Fig. 2) note the value on the lower (horizontal) scale which corresponds to 10 volts in left (vertical) scale. In the example shown in Fig. 2, the value is 80 volts. From this we know that (for rough

1—Gem lamps are scarce creatures these days — many of us never saw one. A Ward Leonard Cartridge resistance unit of 200 ohms does the work excellently *provided* one has the resistance measured on a test box or Wheatstone Bridge. The resistance given on the label is not supposed to be exact. Tech. Ed.

* Roebling Dormitory, Rennselaer Polytechnic Institute, Troy, N. Y.

work only) we can always find the true voltage by multiplying the pocket meter's reading by 80/10, in other words by 8. *Of course the figure is not always 8*, it is just as likely to be 5-½ or 9-¾—but it can be found in this way.

Finding the Meter Resistance

For the other methods of using the instrument it is necessary to find its resistance. The equation by which this may be done most easily is an application of Ohm's law to the current flowing through the meter and resistance. The process is as follows. The current through the meter (Fig. 3) is $I = \frac{E}{R}$

Where E is the voltage read on the meter scale and R is the resistance of the meter. Of course we do not know the meter resistance as yet but fortunately it can be found from the fact that:

$$\frac{\text{Read Volts}}{\text{Meter R.}} = \frac{\text{True Volts—Read Volts}}{\text{Lamp R.}}$$

$$I = \frac{E}{R} = \frac{\text{Read Volts}}{\text{Meter R.}} = \frac{\text{True volts—Read volts}}{\text{Lamp R.}}$$

True volts are taken from the curve. A convenient way is to choose a point such that the *difference between true and read volts is 50*. The resistance of the *specified lamp* at *this voltage* is very close to 215 ohms. Then:

$$\text{Meter R.} = \frac{215}{50}\ \text{(Reading of meter)} =$$

4.3 (Reading of meter)

The above reading is simply the read volts when difference between true and read volts is 50, and may be easily found on the curve. All of this difficulty may be avoided if a *known* resistance of 200 ohms is used instead of the lamp. The resistance need not be exactly 200 ohms but it *must be known*. Do not trust the label on a cartridge resistance or other cheap resistance—have the thing measured by someone who can get a test set or Wheatstone Bridge.

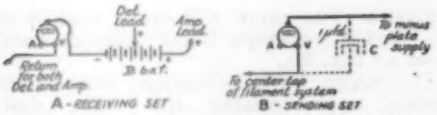


FIG. 4

Milliammeter

The meter may be used also as a milliammeter in connection with circuits having a comparatively high external resistance, such as the plate circuit of a vacuum tube. A single receiving tube will not give a readable deflection but with three or more tubes, or a sending tube, the readings may be made with fair accuracy, though they are not high. Simply connect in series with the B battery at the minus side as shown in Fig. 4A so as to *include detector tube current* which may be taken off at a different positive point from that supplied the amplifiers. The same scheme can be applied to transmitters as shown in Fig. 4B. The condenser C may be used if desired to keep the meter from excessive swinging. The equation is:

$$\text{Milliamps} = \frac{\text{Reading in volts x 1000}}{\text{Resistance of meter}}$$

Low Reading Ammeter

The experimenter often wants to measure current of a value less than one ampere, in a circuit whose resistance is *not* such as to make negligible that of the meter. Such B battery. The voltmeter part of the instrument is used with a shunt resistance,

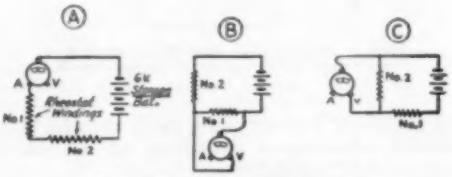


FIG. 5 MAKING AN AMMETER SHUNT

as the ammeter will not be readable on currents of such a small value. Take the resistance coils of two rheostats (new or old) rated at 4 ohms each, or thereabouts. Find the resistance of each as follows: First connect as in Fig. 5A and read the current. Then connect as shown in Fig. 5B and read the voltage across coil 1. Finally connect as in 5C and read the voltage across coil 2.

Since the resistance of the ammeter is negligible,

$$\text{Resistance of coil No. 1} = \frac{\text{Voltage (as in 5 B)}}{\text{Current (as in 5 A)}}$$

also

$$\text{Resistance of coil No. 2} = \frac{\text{Voltage (as in 5 C)}}{\text{Current (as in 5 A)}}$$

Now connect the two coils in series as shown in Fig. 6B. Now the resultant re-

sistance will be the sum of their separate resistances. A convenient way of connecting the two resistances is shown below in Fig. 6A. Note that the contact arms are removed, and the free ends of the coils connected to the post to which these arms were formerly attached. For use the coils are connected in series with the circuit, and the voltmeter placed across their extreme terminals. The value of the current in amperes may be found as follows:

$$\text{Current} = \frac{E}{R} =$$

$$\left(\frac{1}{\text{R. of meter}} + \frac{1}{\text{R. of coils 1 and 2 in series}}\right)$$

This isn't nearly as bad as it looks. We have already found everything but the voltmeter reading and can therefore multiply all the other things together once for all and say that:

Current=Reading times K
where it is understood that

$$K = \left(\frac{1}{\text{R. of meter}} + \frac{1}{\text{R. of Coil No. 1 + R. of Coil No. 2}}\right)$$

If one gets tired of multiplying by K it is easy enough to connect the rig up permanently and make a new scale for the meter.

Conclusions

While the above do not exhaust the possibilities of the little instrument, they will furnish the amateur with some food for

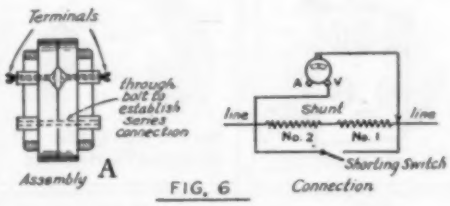


FIG. 6

thought, possibly, as well as saving him a bit of money.

The preceding discussion is not only thoroughly practical, but, with certain assumptions as to negligibility, is mathematically correct. The reader is advised to take readings carefully, with line of sight normal to face of instrument, to treat the instrument with great care, and not to depend on the readings being in any case accurate to more than two figures.

Grid Condenser and Leak Mounting

A VERY handy little device has just been placed on the market by the International Resistance Company of Philadelphia. It is the so-called Durham Resistor Mounting, a combined grid condenser and grid leak mounting. The insulation is of high quality bakelite, whose resistance is said to be exceptionally great. The mounting is arranged to sit vertically on the receiver baseboard, so that connections to the grid circuit and especially the tube socket, will be as short as possible, leaving the other end of the circuit up in the air toward the secondary coil. The condenser clips are spaced to take the type 600 Micadons or any other grid condenser of similar size, and the grid leak clips will fit all standard leaks. Two holes in the baseboard are provided for attaching the mounting to the baseboard. The mountings are also available in double units for use as grid and plate blocking units with resistors in a resistance coupled amplifier.

—*J. M. C.*

Strays

Another Amateur Wins The "Popular Radio" Medal

September *Popular Radio* announces the award of the "Popular Radio Medal for Conspicuous Service" to another amateur, C. B. Harrison, 9DOZ, of Belleville, Ill., for meritorious service at the time of the Southern Illinois tornado in March 1925. It was Harrison's work to which we referred in our editorial in August *QST*, work unknown to us until that time.

When a cyclone destroyed Murphysboro, Ill., Harrison was called upon by the railroad and county medical authorities to broadcast a call for doctors and nurses to meet a special relief train which was being made up. He was at the time under three months' suspension for some minor infraction of regulation, but seized the bull by the horns and did the job. The relief train was jammed to capacity with voluntary workers! J. Andrew White writes another epic tale of amateur accomplishment in his account in *P. R.*

THERE'S ALWAYS SOMETHING NEW IN AMATEUR RADIO!

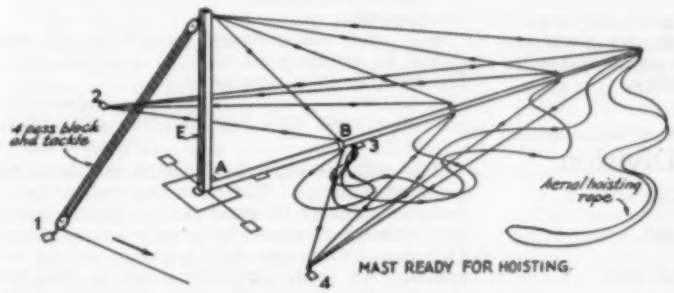
OUTSTANDING FEATURES OF THE PAST 20 YEARS PICTURED BY BUX

Constructing and Erecting a Steel Mast

By Perry O. Briggs*

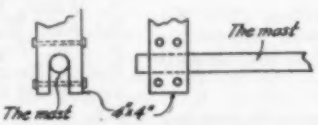
FOR those who have plenty of back yard room, and a good sized bank account, yet do not want to risk their necks balancing on the top of ninety-foot "two by four", here is a mast which can be erected in one piece by one man and will stand the elements indefinitely.

Tall masts are not so numerous as they were, but any scheme that will work for an 80-foot mast is certainly good enough for a 50-foot mast. Three masts have been erected at 1BGF; all of which were successfully raised without any buckling. One of these masts consisted of six sections of galvanized roof drain pipe. Everything was arranged on the ground and the actual raising was accomplished in *less than five minutes*. However, the mast described in this article is 70 feet tall and is made up of four 22-foot sections of steel water pipe. Section 1 measures 3 inches inside diameter; section 2, 2½ inches; section 3, 1¾ inches; section 4, one inch. Reducing couplings are not used. The sections are telescoped into each other about three feet and are secured by four ⅜ inch bolts. Four three-inch collars with galvanized iron rings welded to them are bolted to the top of each section to receive the ¼ inch guy wires.

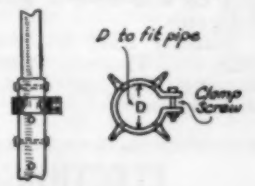


MAST READY FOR HOISTING

The first thing to be done is to provide a suitable foundation and guy anchors. For the foundation, a hole 18 inches square and two feet deep was filled with a mixture of concrete consisting of cement, sand and stone. A varnish can slightly over three inches in diameter was embedded to the rim of the can in the exact center of the concrete, and just before the cement "set" the can was removed thus making a socket for the foot of the mast. The guy anchors are 4" by 4" by 6' long set in the ground at an angle of 60 degrees with cross pieces nailed on below the ground level to hold the anchors firmly in place. There are four guy anchors, each placed thirty feet from the base of the mast. The mast and guy wires were laid out as per diagram. A "hoisting joist" (E in the illustration) was secured to the base of the mast as shown in the small sketch. All the guys which were to go to the No. 1 guy anchor were secured to the upper end of this hoisting joist. A compound tackle was run from that point to the No. 1 guy anchor. Of course it is absolutely necessary to have the length of E equal to the distance between the mast foundation and the No. 1 guy anchor. It is also necessary to use *four* (not three) guy anchors so that the No. 2 and No. 4 guy wires will hold the mast straight as it goes up and the No. 3 guy wires will stop it when it gets there. It is simple to find the correct lengths of these wires, either by calculation or by a drawing to scale. Be sure to remember that you are interested in the *finished* length and that allowance must be made for each joint. All of this takes much less time than the usual step-by-step method of hoisting and adjusting. We found it convenient to make the length of E equal to ¼ the height of the mast and to set the anchors this far out.



METHOD OF SECURING HOISTING JOIST TO MAST



JOINT AND GUY COLLAR

When everything is arranged make sure that all bolts are tight, especially the clamps that hold the hoisting guys. The first mast erected at 1BGF had a nasty fall on account of the eyebolt in the upright pulling out. After the dust had cleared away and our eyes had returned to their normal size we made sure that everything was tight and ship-shape before the second attempt.

Everything being set for the crucial moment, grasp the "fall" of the four to one tackle blocks; pull gently, thus taking up the

* 1BGF, 52 Girard Avenue, Hartford, Connecticut. Builder of the tuner, originally described in *QST*, and now used in English speaking countries as the "1BGF "tuner" and in Latin American as the "Briggs Tuner"

slack. Now pull a little harder. This first hard pull will test all the guy connections of the hoisting guy wires. Gradually the hoisting joist will move earthward and the mast will rise heavenward. When the mast has reached an angle of about forty-five degrees our troubles and worries are over. The strain on the hoisting apparatus becomes less and less and shortly you have the four by four hoisting joist in your hands and by pressing it to the ground your mast is erected. Stake down the hoisting joist and remove the tackle and stay poles. Take off the hoisting guys from the joist one at a time and fasten them to the No. 1. anchor guy; remove the four by four hoisting joist and allow the mast to drop into its socket in the cement foundation. Then with the aid of a level straighten and tighten up the first section and its set of guy wires. In like manner true up the remaining sections and guy wires.

Just before hoisting our mast we applied a second coat of white paint and mast was erected without marring the paint and without danger to life or property.

Northwestern Division Convention

Tacoma, Wash.

October 8th and 9th

ALL members of the League and amateurs are cordially invited to attend the convention. It will be held under the auspices of the Tacoma Radio Club. This will be the first Northwestern Division Convention and a very good program has been prepared. Headquarters is sending A. A. Hebert, Treasurer and Fieldman, and he will have a good message for the delegates.

Director Karl W. Weingarten, 3219 No. 24th St., Tacoma, Wash., will appreciate hearing from all those who contemplate being present.

ELECTION NOTICE

To All A.R.R.L. Members Residing in the Central, Hudson, New England, Northwestern (including Alaska), Roanoke, Rocky Mountain and West Gulf Divisions:

1. You are hereby notified that an election for an A.R.R.L. Director, for the term 1927-1928, is about to be held in each of the above Divisions, in accordance with the Constitution. Your attention is invited to Sec. 1 of Article IV of the Constitution, providing for the government of A.R.R.L. affairs by a Board of Directors; Sec. 2 of Article IV, defining their eligibility; and By-Laws 14, 15, 16, 17 and 18, providing for their nomination and election.

2. The election will take place during the month of November, 1926 on ballots which will be mailed from Headquarters in the first week of that month. The ballots for each Division will list the names of all eligible candidates nominated for the position by A.R.R.L. members residing in that Division.

3. Nominating petitions are hereby solicited. Ten or more A.R.R.L. members living in any Division have the privilege of nominating any member of the League in their Division as a candidate for Director. The following form for nomination is suggested:

(Place and date)

Executive Committee,
A.R.R.L. Headquarters,
Hartford, Conn.

Gentlemen:

We, the undersigned members of the A.R.R.L. residing in the ..... Division, hereby nominate ..... of ....., as a candidate for Director from this Division for 1927-1928.

(Signatures)

The signers must be League members in good standing. The nominee must be a League member in good standing and must be without commercial radio connections. His complete name and address should be given. All such petitions must be filed at the headquarters office of the League in Hartford, Conn., by noon of the first day of November, 1926. There is no limit on the number of petitions that may be filed, but no member shall append his signature to more than one such petition.

4. Present Directors from these Divisions are as follows: Central, Mr. Clyde E. Darr, Detroit; Hudson, Dr. Lawrence J. Dunn, Brooklyn; New England, Dr. Elliott A. White, Hanover, N. H.; Northwestern, Mr. Karl W. Weingarten, Tacoma; Roanoke, Mr. W. Treadway Gravely, Danville, Va.; Rocky Mountain, Mr. Paul M. Segal, Denver; West Gulf, Mr Frank M. Corlett, Dallas.

5. This is your opportunity to put the man of your choice in office as the representative of your Division. Members are urged to take the initiative and file nominating petitions immediately.

For the Board of Directors:
K. B. WARNER, Secretary.

Hartford, Conn., 2 August, 1926.

Strays

8ABX uses ordinary glass test tubes as forms for R.F. chokes. A rubber stopper in the open end of the test tube serves as a mounting to hold the chokes on the panel or baseboard.

Aurora and Its Effect Upon Radio Signals

By W. M. Sutton*

WE have seen it repeated so many times that the Aurora Borealis has no effect whatever upon radio reception, that one is reluctant to make any statement to the contrary unless he is prepared to receive the brunt of many criticisms. And yet, we find everybody in general throughout Canada and the United States is complaining of the very poor radio reception during the past winter. Even the British transmitting amateurs were wondering what had become of the American and Canadian amateur transmitters the past winter, claiming they had much better contact last *summer*. Perhaps the following observations will help explain the reason for such bad DX conditions.

The writer is in a position to keep a very close check upon the Aurora, being able to tell whether it is present, night or day; as he is a repeater operator on a trans-continental telegraph wire. Almost all other statements were made by observers, who could only use the spectacular display in the Northern sky as a sign for the Aurora. In the daytime or at night, when it is cloudy, such observations cannot be kept, and therefore one could hardly call them conclusive.

Instead of starting at the beginning of my observations, I will begin at the other end and go back, because it was in this way that I became more and more convinced that the Aurora has a decided and detrimental effect upon radio signals of certain frequencies.

On the night of March 10th at 11:45 PM I was listening to stations in Toronto on the new Canadian wave of 52.5 meters. Signals were exceptionally strong; 9AL, 9BJ, 3FC, 3VH (these are Canadian stations) all had an audibility of R-10, and u2XAC (Schenectady, N. Y.) on 52 meters was so strong that the signals blocked the detector tube. WIZ (RCA test station) was even stronger and all signals in the 40-meter band were very good. At 12:20 AM all Toronto stations had faded almost completely out, and were just readable with concentration. 3VH was heard talking to 9AL, and asking him what had happened to the signals, apparently suspecting his receiver. At 12:45 AM, 2XAC with all their power was only R-4, and WIZ had dropped in strength to R-5. Only two or three amateur stations on the 40-meter band were coming in and those were just readable. The night was cloudy and the majority of amateurs would be at a loss as to the reason for such a sudden decrease in signal strength. The Aurora came on very strong at 11:55 PM this night, and it took exactly 25 minutes before it deadened signals on these two bands.

A permanent schedule has been kept with Toronto station 3FC since January, and several such occasions as described above have been observed. It appears that if the Aurora is very strong the 52 meter signals die off suddenly; but, if it is just moderately strong and continues, it takes an hour or more before signals are unreadable; and then again, if it is only weak, signals are weak too, and increase in strength as the Aurora lifts. This is on 52 meters. The skipped distance is not so noticeable on this wave as on the 40-meter band, and therefore the different intensities of Aurora affect the latter wave band somewhat differently.

On January 25th and 26th there was not a signal heard here on either 52.5 meters or the 40-meter band, and it will be remembered it was at this time that the Aurora tied up all telegraph communication in Canada and the northern part of the United States. On January the 27th, signals were coming in very weak on the 40-meter band, but I was unable to connect with anybody from this station. January 28th signals had returned to normal strength on both these bands.

Most of the above refers to observations conducted on the new Canadian wave of 52.5 meters, so a few remarks about its effect on the 40-meter band would not be out of place. It appears that, when the Aurora is *either* strong or weak in the daytime 40-meter signals will not come through at all, but at night, moderate Aurora has the effect of seemingly bringing the Heaviside layer down, and stations at a moderate distance, (which should be skipping overhead at this time of the night) come in with exceptional audibility, and DX stations cannot be heard. Weak Aurora makes a slight change in the skipped distance as compared with a normal night, while a really strong Aurora deadens signals entirely on this band.

In March 1923 the Canadian amateurs made their first attempt at a Trans-Continental Relay which turned out very unsuccessfully due to what we called very poor weather conditions; but I can remember that a day or so before the tests the Aurora came on very strong and kept up for two or three days. The night it set in signals did not decrease in strength at all and it was not until the next night that any effect was noticed which would make one believe that Aurora has no effect on radio. This

*Canadian 3NI, Victoria Hotel, Fort William, Ontario, Canada.

was on 225 meters. The same has been observed on the present broadcast band, which accounts for most BCL's saying that they have had wonderful reception when the auroral has been plainly seen in the sky and the next night, when it has disappeared, the signals have lost their volume, and they fail to see the reason.

Perhaps some of you will ask if the Aurora has been on continually throughout the winter. It has not, but it has been so frequent that the ether has not had a chance to straighten up, so to speak, and therefore the poor reception on broadcast waves. On the other hand, we, amateurs, on the short waves are not affected so badly, because when the Aurora lifts, our signals come back almost immediately. The winter of 1923-24 was very good for both broadcast and amateur signals, because the Aurora appeared during the fall and spring, but none was noticed during the winter months. 1924-25 was not as good because we had several disturbances of Aurora throughout the winter, and this winter has been very poor owing to the repeated and strong Aurora. Last fall there was very little, which accounts for the wonderful DX most of our amateur stations accomplished. This is the worst year for Aurora I have experienced in six years observation. Last fall one of the scientists predicted great disturbances of Aurora would be experienced for the next 18 months due to a sun spot maximum and his predictions are beginning to look like facts.

Conclusion

Strong Aurora kills signals from 35 meters up to 500, although the effect is only immediate on signals up to approximately 60 meters.[1] As one goes up higher in wavelength the time lag is increased. The delay between the start of the Aurora and the disappearance or weakening of signals may be as long as 24 hours in the upper broadcast band. The signals also take much longer to come back to normality.

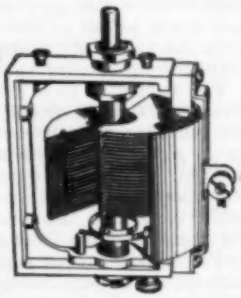
Moderate Aurora makes quite a change on the skipped distance of 40-meter signals, and prevents real DX. As we go ten meters higher the signals gradually fade out. In the broadcast band distant signals are coming in, but fading is very pronounced, and no medium distant stations come through.

Slight Aurora changes the skipped distance just slightly on the 40-meter band, and causes fading on medium distance broadcast stations, but distant stations are fairly steady. The fifty meter signals will push through but are much weaker. Intermittent Aurora, coming for a few hours and lifting for a day, and then coming back again, will cause a continued blanket on broadcast signals, but the short waves will break through whenever the Aurora has lifted.

1. Many of our readers may remember the three days in the winter of 1923-24 when 300-meter spark work absolutely ceased on the North Atlantic Coast and Auroral displays were seen as far south as Norfolk, Va. This display—as is usual—was preceded by large sun spots and a "magnetic storm"—i.e. erratic action of the compass.—Tech. Ed.

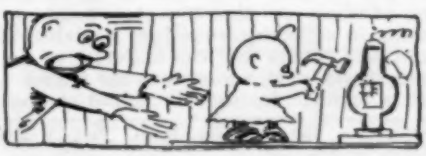
A Straight Frequency Line Condenser

EMBODYING several very unusual features, the condenser shown in the illustration has recently been made available. It is of the straight frequency line type, but differs from the majority of the condensers of this type in that its external dimensions are comparable to those of the usual straight capacity line type of condenser.



The smallness is obtained through the use of exceedingly small plates—exceedingly small when compared to most of the others—and the requisite capacity is secured by the use of a number of these plates. The supporting frame holding the rotor plates is a "U" shaped piece of heavy metal, the other end of the "U" carrying the insulation which is of high grade rubber. Both rotor and stator plates are of brass and are soldered in place. Pig-tail connections are provided to supplement the cone bearing contacts. The required minimum capacity is obtained by a permanently connected fixed condenser composed of two quarter moon shaped plates attached to rotor and stator portions of the circuit. The condenser is made in several "broadcast" capacities and is supplied for short wave use in several different maximum capacities. For short wave work the "minimum capacity" shield is omitted. This very nice job is the product of the Samson Electric Co. of Canton, Mass.

—*J. M. C.*



Wavelength-Frequency Conversion Chart

THE WAVELENGTH-FREQUENCY CHART SHOWN HERE IS DUE TO CAPTAIN TOM RIVES, WELL KNOWN TO A.R.R.L. MEN THRU HIS WORK IN CONNECTION WITH THE ARMY-AMATEUR NETWORK, AND WHO IS NOW ATTENDING A COURSE IN COMMUNICATION ENGINEERING AT YALE UNIVERSITY.

THE OPERATION OF THE CHART IS AS SIMPLE AS CAN BE IMAGINED. FIND THE NUMBER WHICH STANDS FOR THE WAVELENGTH IN METERS YOU ARE INTERESTED IN; OPPOSITE IT IS THE CORRESPONDING FREQUENCY IN KILOCYCLES. THE SAME NUMBERS CAN BE USED FOR WAVELENGTH-FREQUENCY CONVERSION AND FOR FREQUENCY-WAVELENGTH CONVERSION; JUST START WITH ONE AND THE OTHER IS OPPOSITE.

"Ham"

By C. E. Tamm*

DO the code hounds of radio, who seem universally to have adopted the nickname of "Hams", really know what this term stands for?

To be called a "Ham" on a land line is the premiere insult, and even though realizing his short-comings, the poorer the operator, the more he resents being called a "ham."

True, the term can be applied to some of the "CQ" demons, but it seems a shame to apply it to all transmitting amateurs, especially after listening to some of the "copper plate" stuff that may be picked up nightly.

Long before Marconi and De Forest had produced anything that would transmit characters without the aid of wires there were "hams."

To the railroads goes the honor for producing the real dyed-in-the-wool "ham."

Time was, years ago, when to be a telegraph operator on the railroad was the pet ambition of at least one youngster in every small town. A full-fledged operator was of considerable importance in his community and not a little sought after by many of the comely young ladies of the village.

The magnanimous railroads created positions for "helpers." A helper's duties were multiple; sweep out the depot, carry the mail to and from the post office, help the train crews load freight and baggage, flunky around the warehouse, take care of the pumping engine at the water tank and do any and all other jobs that no one else would do. After all this was done the helper could practice telegraphy. This privilege being his principal remuneration for his 12-hour day of labor.

Night times, while the regular operator curled up on a table and slept, the helpers had full possession of the idle wires, which in the day time were used for messages and car reports.

Midnight, dead silence except for the snores of the operator. Off in the distance a dog, suffering from insomnia gives vent to his feelings. Then there begins a confused clicking of a telegraph sounder, giving forth halting characters. As the arm of the sender, stiffened from a day's labor in the warehouse, limbers up gradually, there is formed an office call, repeated many times, eventually to be answered by the helper at the office being called.

Invariably the conversation would start: "H o w i s m y g i r l?", spelled out very slowly and haltingly. Then a tedious exchange of the bits of gossip of interest to no one but the two future train dispatchers.

After many months of this the helper would go into division headquarters, take his examination and (if acceptable), would be assigned to a regular position as telegraph operator.

Then he became, in the parlance of the commercial and railroad operators in the relay office, any number of dashed and blanked kinds of a "HAM!" Probably some really old timer, long since grown old in the service, may be able to tell with certainty just how the term first originated. By the comparatively late comers in the game, it is generally conceded that the term "Ham" was applied to the plodding student because his Morse characters sounded a great deal as if they were being formed by a huge ham instead of a hand, on the sending key.

Another term used in land line telegraph is "Lifting the 'Lid.'" "Lid" being another term applied to a young operator who "breaks" on every other word and whose sending is so full of "combinations" that even old timers are at a loss at times to decipher just what the "lid" or "ham" is trying to say.

As I listen to the hum and whine of the vari-toned CW's, I am inclined to the belief that all the original "hams" with their "H o w i s m y g i r l" have forsaken the land lines for radio with its "C U A G N OM." But even at that the term "ham" is a label to many of the senders on the ether.

* 1211 State St. Milwaukee Wisconsin.

Strays

Who says the amateurs are not running broadcasting stations? From WTIC, The Travelers Insurance Company's station at Hartford, we find the following line-up of hams: Chief Engineer Randall 1ANQ; Chief Op. Taylor, 1IAT; Operator Mix 1TS; Op. Herriott, 1AOI; and Operator Tucker ex 1ADP. All of the operating force at WTIC who were old enough to enlist were in the Government Radio Service in some form or other during the World War. And this is just one broadcasting station from some five hundred.

2CXL, 2API and 1AOA have a new abbreviation. "YX? Are you rushing the young ladies"? "YX R1 to R9—Yes I am rushing the young ladies at present (in proportion to the R's)"—hi!

Experimenters' Section Report

FOR organization details the reader is again referred to page 38 of our July issue. We lack space to print this information each month. If you have not the July issue please ask us for details but *please* enclose a self-addressed envelope.

The July-August 5-Meter Tests

The 5-meter test series have just run out as this is being written. This is the 30th of August and "copy" cannot be turned in after tomorrow so there is no point in waiting for reports. Requests for reports are being sent out to all who are known to have taken part in the tests and others are are hereby asked to give all details of their experiences.

It is not anticipated that there will be a great deal to report for experience has shown that the weakest spot in the present tests lies in the very great uncertainty as to the operation and wavelength-range of the receiving equipment. At several stations this has been checked up and after careful work a tuner has been built that gives very much better results.

The Need for 5-Meter Wavemeters

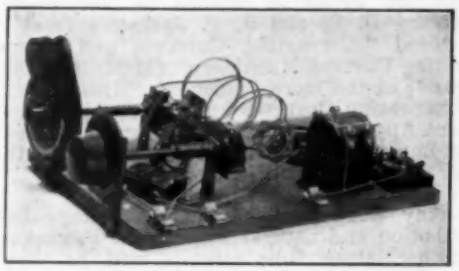
The biggest difficulty is in knowing that one is really listening on the same wavelength at which the other fellow is send ing. With one exception ALL of the successful transmissions have been made after a wavemeter was carried over the route and the receiving set calibrated with the same wavemeter used at the sending end. Some additional tests will be made after a batch of wavemeters have been made up and distributed.

More of this later.

Concerning 5-Meter Receivers

The difficulty with most of the receivers seems to be in the absolute inability of their builders to appreciate how small a change of capacity will cause the tuning to whiz across the desired signal. The condensers used are almost always too large and the construction is almost always such as to permit vibration and hand capacity to spoil the action.

Illustrative of the workable kind of receivers is the one here shown which was made by Norvell Douglas of 9EHT at Lawrence, Kansas. The tuner uses the Armstrong tuned-grid, tuned-plate circuit shown in Fig. 2B on page 35 of the July issue, except that it was found desirable to bypass the R. F. around the audio amplifier with the aid of a micadon condenser (shown between the tuning condensers) and to make sure that the R. F. used the bypass by putting the Lorenz-coil in series with the audio transformer primary as an R. F. choke. The distributed capacity of the audio transformer will permit oscillation in the original circuit but the stability is better with the bypass and choke. Note that the choke is suspended clear of the baseboard. This was found necessary but the vibration had to be damped by guying the coil with threads, one of which can be seen in the original photo, tho possibly not in the magazine reproduction. The tuning condensers are Hammarlund "vernier" condensers driven by bakelite shafts to prevent hand capacity effects. Here is an important point. These bakelite shafts were originally 5 inches long but the "whip" made it impossible to find a signal. The trouble was located by testing on a local



oscillator and shortening the shaft. This tuner is a big step in the right direction but the uncertainty as to the *sending* stations compelled the use of an excessive wavelength range, i. e. from 4.9 to 7.0 meters. Does that sound small? Well it is ENORMOUS!! It covers 18,360 kilocycles or much more than can be found between 20 meters and 20,000 meters. What chance would one have of tuning in even NKF with a tuner that rushed from 20 to 20,000 meters with a single turn of the tuning knob? How much less chance is there of finding a faint signal which is unsteady as most of our 5-meter stuff is? Even when one knows just where the signal is to tune in the most careful manipulation is necessary.

The tuner with which further work will need to be done will have very much smaller condenser capacity. Budlong suggests a fixed plate with a short piece of curved wire to act as the movable plate, the wire being mounted on the tuning shaft.

A New Record

The real problem is to find out what 5-meter waves do in the ether, but that does not keep one from feeling elated over DX work when it happens. It seems certain now that 2AUZ has been heard on

schedule at Hammond, Indiana, also that several 3rd district stations have been heard on Long Island. Check tests are being planned and details will be given later. If these are freaks we have three such. In view of the extremely poor conditions under which they have occurred they hardly seem like freaks.

The Outlines

All the problem outlines but two have been sent out. These two are being held for a few days but will have been sent out before this magazine reaches the members. The outline on antennas for poor locations appears to be the favorite as most of the men enrolled seem to regard theirs as a poor location.

Books

Several requests for books on alternating current theory arrive each week. These have been answered by postcard. Naturally there is room for opinion on such things but the writer is inclined to feel kindly toward D. C. and J. P. Jackson's freshly revised "Alternating Currents and Alternating Current Machinery" (McMillan) for $6.00; or the more condensed, "Elements of Alternating Currents and Alternating Current Apparatus," by J. L. Beaver, published by Longmans, Greene and Co. at $4.00. Both of these books will be reviewed in *QST*.

R. F. Chokes

Any work available on the voltage-distribution and natural wave of R. F. chokes in oscillating tube circuits will be very much appreciated so that it may be tied in with work done by Mr. E. G. Watts of Miami, Fla., and Mr. C. H. Starr of St. Catherines, Ontario, both of whom have been mentioned in this connection. Their work has developed some peculiar effects that are not well understood and might possibly be explained by other work along the same line.

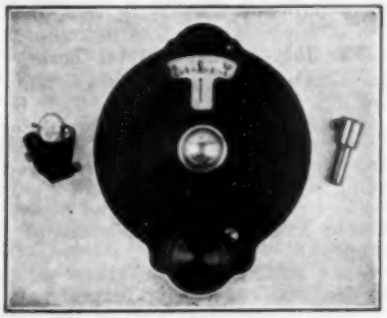
Short-Wave R. F. Amplifiers

With improved understanding of R. F amplifier action in the 200-600-meter region we begin to feel more hopeful of the future of R. F. amplifiers in the sub-200 region. An outline has been written on this subject and it has been thought wise to confine it mainly to a discussion of the methods used to determine the goodness of the results. This outline will need revision and anything at all on the subject will be helpful—references, designs, experiments and theories.

—*R. S. K.*

A New Illuminated Dial

THE dial shown in the photograph is the latest version of the excellent National variable ratio vernier dial. Illumination is provided in a very novel manner. The lamp (shown at the left) is



attached to the rear of the panel, and projects through a hole in the panel into a "cupped out" place directly behind the trade mark on the front of the housing. Rays from the lamp project downward in the space between the dial and the housing and complete illumination of the dial results. The lamp is held in place by screws which are attached to two moulded-in inserted machines screws, set in the rear of the bakelite housing. An additional machine screw is moulded in the housing behind the control knob. These screws hold the dial very firmly in place against the panel. The lamp operates directly from the 6-volt A battery. At the right of the photograph is a coupling unit designed to accommodate the National Condenser for use with the variable ratio dial.

—*J. M. C.*

Strays

Every A.R.R.L. member should subscribe to the *Radio Service Bulletin*, the monthly news sheet published by the Government. It costs twenty-five cents a year and is secured from Superintendent of Documents, Government Printing Office, Washington, D.C. In addition to containing all the latest dope on Naval, Commercial, Army, Experimental Amateur and Special licenses and call letters the *Bulletin* announces forthcoming papers of the BuStan, has a complete tabulation of *all* radio papers and articles appearing in all radio magazines, contains a list of Standard Frequency Stations and much other information of value to you all.

Hints On the Design of Small Power Transformers

By Allen H. Babcock*

ALL transformer design goes back to the fundamental formula for induced E.M.F.;

$$E = \frac{4.44\ f\ n\ \Phi}{100{,}000{,}000}$$

where E = the volts for which the transformer is to be designed
f = frequency of the supply circuit in cycles per second
Φ = total flux
n = turns of wire
Also Φ = area of core (measured at right angles to the direction of the flux) multiplied by the unit flux, i. e., the number of magnetic lines per unit of area. This is denoted usually by B.

By substitution and transposition we have

$$n = \frac{100{,}000{,}000\ E}{4.44\ fBA}$$

Where A=cross sectional area of the core, measured at right angles to the direction of the flux as stated above.

Usually we know E and f. B, we may assume for ordinary iron = 50,000 lines per square inch for all ordinary frequencies of power supply, say 25 to 60 cycles; and we have left two quantities, B and A, that vary inversely. Their product must be kept constant so that if we increase either one we must decrease the other in the same ratio.

Expressed in other words, we may use a small iron core and have many turns of copper wire, or we may have a smaller number of turns of wire with a larger core.

For ordinary frequencies of power circuits, say from 25 up to 60 cycles, it matters little, as far as the iron losses are concerned, whether the core is large or small; but when we come to the higher frequencies, 300 to 700 or 800 cycles, the situation is very different, for one of the iron losses varies as the square of the frequency and directly as the flux, while the other varies as the square of the flux and directly as the frequency.

The iron losses are worth considering for two reasons; they have a lot to do with the cost of running the transformer, and they heat the core which in turn heats the copper windings in addition to the heat developed by the ohmic resistance of the copper.

* Director Pacific Division A.R.R.L., 65 Market St., San Francisco, California.

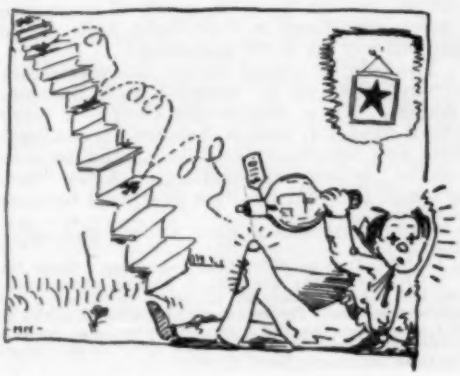
It is easy to see, now, that transformer design is largely a matter of cut and try, not something for which a hard and fast formula can be developed. This is why the usual handbooks fail to be of much help to the beginner who has a transformer to design.

My plan is to assume a core for which the iron can be obtained in standard sizes, then with the quantities that are known and by assuming values for the unknowns somewhere within reason, substitute in the fundamental equation, solve for the complete transformer, and see how it comes out. Then juggle the various quantities around until (in the case of high frequencies) the iron losses are not too much larger than the copper losses, and when the volts of any coil divided by the turns of that coil come out about one or one and a quarter, I call it done.

As a guide for a beginning: for low frequencies assume B = 50,000 and A about 10 sq. in.; for high frequencies assume B = 25,000 and A about 2 or 2½ sq. in. and you will not be far out of the way for small transformers, say up to 1 K. W. and for maximum voltages up to 5 or 6 thousand.

The hand-and textbooks will guide any one who wishes to compute his iron losses; the copper losses are simply the usual I²R.

Factory engineers who design transformers every day have many useful short cuts learned by experience. College professors who teach these things will find my methods crude and lacking in refinement. Both should remember, if they feel disposed to criticise what I have written, that the ham who needs a small power trasformer is concerned with neither short cuts nor refinements but must cut his coat according to his cloth.

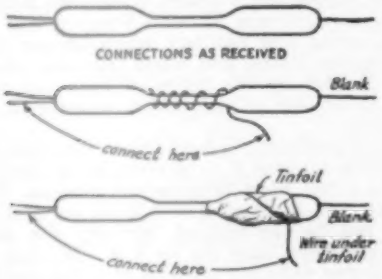


Neon Tubes and the Radio Transmitter

By C. A. Briggs*

ONE of the glow tubes now sold for radio use or the common kind sold for testing spark plugs, forms a handy part of a radio transmitter. Fastened at one end to the helix it glows whenever the circuit is oscillating, whatever the wavelength. The free end of the tube must extend in a proper direction readily found by trial. This arrangement is particularly convenient where experiments or adjustments are made. It is unnecessary to hunt around with a wavemeter or receiving set to learn whether the transmitter or oscillating driver, is oscillating.

These tubes, as mentioned in other articles, are also convenient indicators for



ONE TYPE OF TUBE AND WAYS OF IMPROVING SENSITIVITY

wavemeters and are coming into use for this purpose. They are sufficiently sensitive. Sharp settings can be made, either by using a loose coupling *just sufficient* to operate the tube at resonance, or at closer couplings when the point of maximum brilliancy is really used The tube will not be harmed where a flash-light bulb will be burned out.[1] There is no inertia in the action of the tube; they will give a good flash to catch the eye when the dial is turned rapidly thru the point of resonance under conditions a flash-light bulb would fail utterly to show anything.[2]

The tube is placed across the wavemeter circuit, that is, in parallel with the condenser. In a wavemeter using a very small capacity, this will upset the calibration and therefore the tube should be connected before calibration. After that attempt to avoid needless overloads because the use of a new tube will call for re-calibration unless it is very much like the first one. It is generally necessary to make some changes in the flash tubes as purchased. To perfect the connection with the ends of the tube, see the diagram. The original connections may be used if they give good sensitivity but usually there is too much machinery about the tube and some of it must be taken off. Work carefully, remembering that it is very easy to tear off the little wire sealed into the end of the tube.

The work of adjusting and changing a transmitter is wonderfully expedited by two tubes, one connected to the helix to show when the circuit is oscillating, and the other across a wavemeter to indicate resonance.

These tubes can now be bought quite cheaply. They contain rarefied amounts of argon, helium or some sensitive gas. Some tubes are more sensitive than others.

* 3CAB, 1311 Spring Road, N. W., Washington, D. C.

1. Still—it *is* possible to burn them out. Tech. Ed.
2. However they are not so prompt about going out because the extinction voltage is much below the ignition voltage. The resonance indication is not quite the same when the dial is turned clockwise as when it is turned counter-clockwise. This effect is minimized by loose coupling. Tech. Ed.

A.R.R.L. Information Service Rules

Please help us by observing the following rules:

1. Keep a copy of your questions and diagrams and mention that you did so.

2. Number the questions and make a paragraph of each one.

3. Make diagrams on separate sheets and fasten them to the letter.

4. Print your name and address (not merely your radio call) on your letter. Don't depend on the return address on the envelope as this is destroyed when the letter is opened.

5. Don't ask for a comparison of the various manufacturers' products.

6. Before writing, search your files of *QST—the answer probably is there.*

7. Address all questions to Information Service, American Radio Relay League, Inc., 1711 Park Street, Hartford, Conn.

8. It is not essential to enclose an envelope as long as you supply postage and PRINT CLEARLY your name and address on your letter.

A Radio Picture Demonstration

AT the last show of the Northwest Radio Trade Association, (which is not in Seattle but in the Twin Cities) there was staged an interesting demonstration of radio picture transmission. The following account is quoted partly from letters of D. C. Wallace, president of the association (likewise of 9ZT) and partly from a report by James P. Barton and John K. Hilliard who operated the equipment.

The Northwest Radio Trade Association requested that the apparatus and materials be assembled. The machines were purchased from Mr. C. Francis Jenkins of Washington, D. C., and after the show were given to the men who operated the equipment. Since the equipment purchased from the Jenkins Laboratories consisted only of the actual transmitting and receiving units, the auxiliary apparatus was gleaned from every conceivable source in the Twin Cities. Very fine sensitive relays were borrowed from the Telephone department of the University of Minnesota. Various kinds of receiving equipment were used. At one time a superhetrodyne was used so that the relay operating the recorder could be placed in the plate circuit of the second detector. At another time the receiver shown in the diagram was used.

THE APPARATUS SET UP AT THE NORTHWEST RADIO SHOW IN THE ST. PAUL (MINNESOTA) AUDITORIUM

The other set was at the far end of the auditorium 600 feet away. From left to right the men in the picture are: Prof. C. M. Jansky, Jr., Director Dakota Division A.R.R.L.; R. E. Earle, Radio Inspector 9th District; R. K. Hilliard, operator at 9XI, also operator of the Jenkins transmitter; D. C. Wallace, President, Northwest Radio Trade Association; J. T. Barton, operator at 9XI and operator of the Jenkins receiver; H. R. Skifter, operator 9YAS, former district superintendent Minnesota District No. 2, now manager WCAL; R. N. McCord, President, Twin City Radio Club and chief operator A.R.R.L. booth at show. The apparatus was worked under the call of 9ZT by special permission from Supervisor of Radio, E. A. Beane.

Quoting from the report from Messrs. Barton and Hilliard: "The machines were taken to the Northwest Radio Trade Association show held in the St. Paul Auditorium and demonstrated during the entire week.

"An illustrated lecture was given in the afternoon and evening on the equipment, explaining its operation.

"The Argus Leader of Sioux Falls, South Dakota, engaged us to take the equipment to Sioux Falls to a radio show held there October 16 and 17. The apparatus was packed up, sent down and worked more successfully than at the St. Paul Show, as we had a chance to work on it and remove some of the features which bothered us at St. Paul.

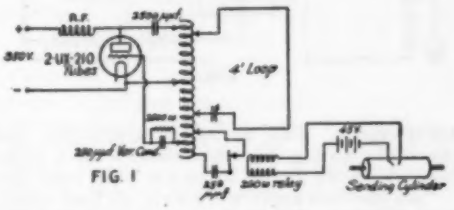


FIG. 1

"The two machines were placed close to each other so that the audience could easily see both machines in operation at the same time. At first they were placed across the Auditorium and this was found impractical since the people wanted to see both the transmitter and receiver in operation at the same time.

"The set-up consisted of two units; one a transmitter, and one a receiver. Each unit was constructed with a Jenkins Midget Model picture machine as the core.

"The transmitter consisted of a Hartley oscillator using two UX-210 power tubes fed by storage A and B Batteries. The Jenkins Conductive ink was used in all of the transmissions. (This is a graphite ink which is a fair conductor. Pictures are drawn, or writing done on ordinary paper with this ink. The paper is then wrapped around the transmitting cylinder so that the picture will revolve under the two contacts of the sending relay shown in figure one. —Tech. Ed.) When a line passes under the contact the ink closes the operating circuit of the high speed telegraph relay which cuts a 250-μμfd. condenser across part of the transmitting inductance, thereby compensating the wave. (See figure 1)

"The original wavelength was 185 meters but we found at demonstrations and in tests

that body capacity would effect the frequency. We shifted the wavelength to 580 meters as the back wave and 565 as the working wave. The purpose for using a compensated wave was that there is practically no lag between the time the relay closes the L. C. circuit and the shift of the

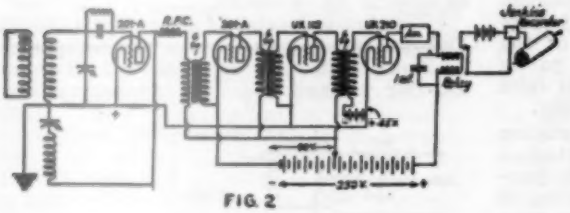


FIG. 2

wavelength. The action is electronic and therefore no lag in comparison with a relay lag, which we found to be the only real one.

"As the two units were only 20 feet apart, a single-turn 4-foot loop was used for the radiating system. Storage batteries were used as we could get plenty of them from the dealers who were displaying at the booths. Otherwise we used an M. G. set for plate supply.

"The receiving unit consisted of a detector and three audio stages using 201-A's for detector and first step, UX-112 for second, and a UX-210 for the last step. The coupling transformers were G. R. 6/1, although a 2/1 in the last two stages would be better, using a higher plate voltage. The circuit is a straight "Weagant X" with a short-circuited primary coil to broaden tuning. The accompanying circuit diagrams give all the values of voltage, apparatus, etc. The various values of plate and bias voltage were obtained from the static characteristic curves of the tubes.

"In the plate circuit of the last audio tube was placed a milliammeter and a relay similar to the one in the transmitter. The grid of the UX-210 tube was biased sufficiently to bring the plate current to zero with no impressed signal on the grid. The normal variation of plate current was 0 to 50 mils but 0-20 would operate the relay in fine shape. The relay closed a local circuit operating the stylus recorder which impressed upon the carbon paper, drawing lines.

"In this amplifier we found that a beat note of about 1500 cycles gave the greatest amplification or change in plate current. This method, by the way, is a very good one for determining the amplification curve of the AF transformer with regards to frequency, the Ip deflection in the last tube being the criterion. The reason for biasing the last tube so that Ip was 0 was that the greatest change in Ip could be obtained at that place on the curve with the least change in grid potential. This seems to be characteristic of power tubes, much more so than in lower Ep tubes.

"It was also found absolutely necessary to place a one μfd. condenser across the terminals of the receiving relay to by-pass the beat note frequency which, without the condenser would cause the relay to clutter and reproduce as a miniature loud speaker.

"We have had very little time to work on these machines but we have a large number of ideas for improvement on the two units. We shall continue to work with these units from time to time with a view to a permanent set-up."

Quoting from Wallace's letter; "You may also be interested in the Twin City Radio Club booth at the N.W.R.T.A. Show. Over seven hundred messages were started by Twin City stations. A small transmitter was right at the booth and many of the messages were cleared from the booth itself with no interference to radio reception in the room. A wavelength of 40 meters with 1000 volts of Eveready "B" battery on a pair of UX-210 tubes was used."

—*R. S. K.*

Strays

At last we've discovered who started this business of "moving Headquarters west". It must have been the *Chicago Tribune* for that eminent daily is willing to tackle even the moving of our national capital to the middle west. The following editorial appeared in their columns this past summer:

WHY WASHINGTON?

The President and Mrs. Coolidge have gone into the Adirondacks and for the summer the President's office and home will be in a camp on Lake Osgood. That proves that Washington is not the place for the national capital. Part of the year it is too hot for work and although it might be a good thing for the legislative branch of government to have it so, the advantage is lost because Congress skips out about the time the pavements begin to steam.

Hamilton may have been justified in the deal he made with Virginia, trading the Potomac capital site for support for his assumption of state debts, but all the equities of that bargain have been dissolved. Virginia spent four years worrying the government in that location and before that the British found it convenient of access.

There are any number of fine capital sites in the interior of the country far enough from the Hudson river to be protected from both alien and eastern influence. Our preference is and has been the east coast of Lake Michigan at or in the neighborhood of Grand Haven.

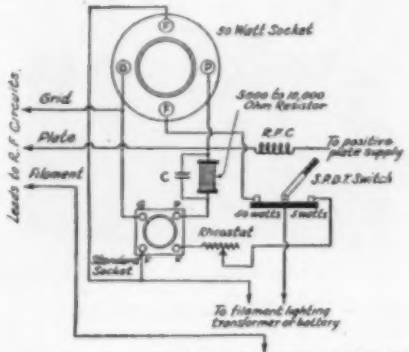
It looks like something can always be said against any location. It gets pretty hot in Hartford in summer, too, and we've thot longingly of headquarters in Etah, with the *Bowdoin* distributing *QST*. But each winter we incline to the fancy that Havana would be a pretty nice place. Why can't A.R.R.L. have its headquarters on wheels?

Reducing Power for Local Work

By Rufus P. Turner*

THE fourteenth U. S. radio regulation reads: "All stations shall use the minimum amount of energy necessary to carry out any communication desired." The same words, (or words to that effect) constitute regulation five printed on amateur station licenses, yet—how many of us abide by this law? How often I hear hams in my city pounding away with an input of fifty and a hundred watts merely to chew the rag with another station which is only a few blocks distant. This kind of operation invites complaints and creates a great deal of QRM. We all agree that the amateur should obey regulation fourteen, but when we suggest reducing power, the average amateur will argue that the only practical methods are: the operation of separate transmitters (which involves expense); the use of high-power and low-power tubes in the same set (which requires separate plate supplies) and the taking-out and putting-in of tubes in the same circuit (which involves time). The average transmitting amateur would rather have some arrangement by which the high-power and low-power tubes may be included in the wiring of the same transmitter with only one control with which to change from one power to another.

After much experimentation, I ran across a suitable system and am describing it in this article. The only control is a S.P.D.T. switch. The change is accomplished by shifting the filament current from one tube to another. The smaller socket accommodates a five-watter and the larger socket a fifty-watter. A 5,000- to 10,000-ohm resistor is connected between the plates of the two tubes for the purpose of reducing the 1,000-volt plate supply to five hundred volts for the low-power tube. It may be necessary to use several resistors in parallel so that the required current may pass. The writer used two RCA 5,000-ohm transmitting grid leaks.



REDUCING POWER FOR LOCAL WORK. The circuit is shown for shunt feed but can be modified.

* 3LF, 427 Franklin St., N. W., Washington, D. C.

Standard Frequency Schedules

THE O.W.L.S. Committee is glad to announce the resumption of its Standard Frequency service, starting with 1XM on October 15th. The schedules from 1XM are by courtesy of the Communications Division of the Massachusetts Institute of Technology and the M.I.T. Radio Society. Sunday afternoon schedules in the 15 megacycle (20-meter) band have been added in answer to a large number of requests. We hope, by the middle of winter, to have three O.W.L.S.-S.F., one on each coast and one in the Mississippi valley. In answer to requests from a number of foreign users, tentative schedules for a month in advance are also given. 1 Megacycle=1000 Kilocycles=1,000,000 cycles.

The schedules here given are approved by the Bureau of Standards and the A.R.R.L. O.W.L.S. Committee as well as by the co-operating stations. The frequency values are based upon the standards of the Bureau of Standards, and have also been checked by the Communications Laboratory of the Massachusetts Institute of Technology.

Friday Evening Schedules (PM, Eastern Stand. Time) (Frequencies in Megacycles) (Approx. wavelength in parentheses)			Sunday Afternoon Schedules (PM, Eastern Standard Time) (Frequencies in Megacycles) (Approx. wavelength in parentheses)	
Time	Schedule No. A	Schedule No. B	Time	Schedule No. C
8:30	3.50 (85.7)	6.50 (46.1)	3:00	10.0 (30.0)
8:42	3.60 (83.3)	6.75 (44.4)	3:12	12.0 (25.0)
8:54	3.75 (80.0)	7.00 (42.8)	3:24	14.0 (21.4)
9:06	3.90 (76.9)	7.25 (41.3)	3:36	14.5 (20.7)
9:18	4.00 (75.0)	7.50 (40.0)	3:48	15.0 (20.0)
9:30	5.70 (52.6)	7.75 (38.7)	4:00	15.5 (19.3)
9:42	6.50 (46.1)	8.00 (37.5)	4:12	16.0 (18.7)
9:54	7.00 (42.8)	8.25 (36.3)	4:24	18.0 (16.7)
10:06	7.50 (40.0)	8.50 (35.3)	4:36	20.0 (15.0)
10:18	8.00 (37.5)	8.75 (34.3)		
10:30	8.50 (35.3)	9.00 (33.3)		

Dates

October 15, No. A, 1XM
October 29, No. B, 1XM
November 12, No. A, 1XM
November 26, No. B, 1XM
November 7, No. C, 1XM

Division of time of each transmission

3 minutes— QST QST QST u 1XM 1XM 1XM
3 minutes—5 second dashes broken by "1XM" every half minute
1 minute—announcement of frequency in megacycles (8.75 megacycles is sent as "8r75MC")
1 minute—announcement of next frequency in megacycles

Short Wave Tuner Kits

WITH so many good receivers available in knock-down form, no one should have any hesitancy in constructing a short wave receiver. In addition to being cheaper in the self-

FIG. 1 REAR VIEW OF THE GROSS RECEIVER ASSEMBLED AND FRONT VIEW OF THE GROSS RECEIVER

assembly form, there is a lot of satisfaction to be had in assembling and wiring your own set. And if it is your first short wave tuner (even though you have done nothing more than closely follow blue printed dia-

FIG. 2. PARTS OF THE REL TUNER

grams) the feeling of having accomplished something is a happy one.

In Fig. 1 appears a photo of the assembled tuner, parts of which are available from J. Gross & Company of New York City. The circuit used is the fixed-tune primary, condenser-tuned secondary and throttle condenser regeneration control. The condensers are the double-spaced Hammarlund. The coils are also made from Hammarlund inductances, being of the 3-inch diameter, No. 16 wire wound ten turns to the inch. The coils are mounted on bakelite strips fitted with General Radio plugs, which in turn fit a corresponding terminal strip equipped with G-R jacks. Sufficient coils are provided to cover all of the ham bands. One antenna coil is used throughout the complete range of the receiver. This is also of the Hammarlund type, mounted on a swinging arm so that the coupling can be readily adjusted. The tuner incorporates a detector and one stage of Thordarson of General Radio audio frequency amplification. The sockets are of the spring cushioned type to eliminate microphonic disturbances. An Amperite filament control is used on the amplifier tube, a variable resistance being used with the detector. The dials are the well known Marco type with a 11-to-1 vernier ratio. The receiver is supplied in knock-down form with everything required.

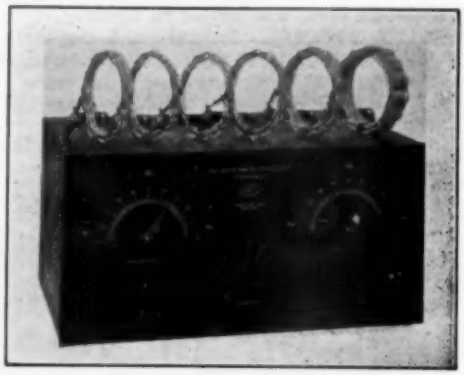


FIG. 3. THE REL TUNER ASSEMBLED

The REL short wave kit, shown in Figs. 2 and 3, is supplied by the Radio Engineering Laboratories, also of New York City. In this receiver Lorenz type coils are used in primary, secondary and tickler. The coils are wound to a diameter of 2¾ inches, the wire being triple covered annunciator type. Coils to cover all of the amateur bands are included. As the primary-secondary coupling is fixed, several separate primary coils are provided so that dead spots in the antenna circuit (due to resonance of harmonic resonance) can be avoided. Everything that is not mounted

on the panel is attached to the long narrow bakelite strip shown in Fig. 2. The body of the sockets is made of the strip itself. The tuner is supplied with a beautifully engraved bakelite panel, the engraving taking care of secondary and regenerator condenser scales and rheostat positions. A single rheostat controls both amplifier and detector tubes, the amplifier being a single stage one. The condensers are of the REL type, being made with very large plates having an unusually large spacing between

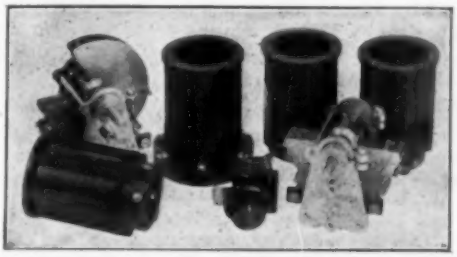


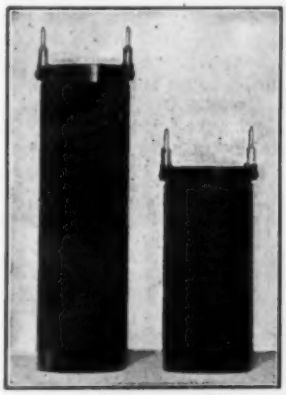
FIG. 4 THE SILVER MARSHALL PARTS

them. The set is supplied with an unshielded panel and rubber friction verniers mounted on extension projecting well away from the panel. The receiver comes to you in the form shown in Fig. 2, and when completed looks (externally) like the photo in Fig. 3. It is supplied complete with cabinet, panel and all parts and wiring, spaghetti and screws.

Although not a complete kit in that tube sockets, rheostat, panel cabinet and so on are not supplied with the parts, the new Silver-Marshall set of short wave parts shown in Fig. 4 deserves mention. The coils are of their latest type, being wound on moulded bakelite forms, the forms having ribs in which notches are moulded. The wire in the inductances is No. 26 enamel, being spaced by a distance about equal to that of the wire itself. The coils are plug-in, fitting the ring socket which carries all of the terminals. The circuit intended for use with the parts is a condenser-tuned secondary one, the regeneration being controlled by a throttle condenser. A small low maximum capacity variable condenser (shown in the center of the photograph) is used as the series antenna condenser in place of the antenna coil. The main condensers have a maximum capacity of 140 μμfd. and with the coils supplied, cover all of the amateur bands. —*J. M. C.*

Plug-In Chokes

IF your transmitter is to cover a very wide band of waves it will be necessary to use some form of interchangeable radio frequency choke coils. Home-made plug-in chokes have been previously described in



QST. Commercially manufactured chokes are now available. The chokes shown in the illustration are made by the Allen D. Cardwell Mfg. Corp'n. Three types are available. One for 20, 40 and 80 meters, one for 150 meters to 200 meters and the other a "universal" for receiving sets. The coils are wound on hard rubber tubing and are supplied with plugs and jacks.

Strays

On page 36 of the September issue, in the article "Radiotron Model UX-210", we made an error in setting the formulae. The second and third paragraphs on that page should read as follows:

The straight line finally obtained is the optimum load characteristic and its slope is the reciprocal of the load resistance. This line gives the maximum and minimum plate voltage and plate current and the output power is calculated from the following equations:

$$P = 1/8\ (E_{max} - E_{min})\ (I_{max} - I_{min})$$

The load resistance is, of course,

$$\frac{E_{max} - E_{min}}{I_{max} - I_{min}}$$

and knowing these two quantities the A.C. plate current can easily be determined or it can be directly calculated from the plate current swing as shown on the curves.

To clarify the use of this method an example is given below for the 350 volt case.

Given Eb=350 volts
I=1.5 m.a.

A Portable Transceiver

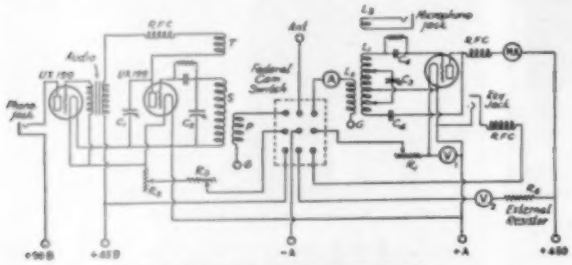
By Frank A. Gunther*

IN THE old days portable sets were in fashion only in the summertime; nobody cared to sit out in a field with a portable station during the winter. However, nowadays there are some of us who have actually come into the habit of hibernating to Canada in the summer and Florida in the winter; therefore have need for a transmitter-receiver. Looking further ahead, when one comes home happy and broke, the set should be able to continue operating in the home—for the owner will not be able to buy another for a while.

This set fits these conditions, besides coming in handy to the person that is unable to get away from business for a vacation, for it fits into a desk and the like very nicely.

Before proceeding, please get accustomed to the fact that this set works (the combination) quite as well as if they had been built for a fixed amateur station, also that the set looks in place when used as such.

Radio sets should be built first and then the cabinets should be put around them. For the sake of contrariness this one was made the opposite way—the cabinet and then the set to fit. This cabinet is a lady's hat box.



COMPLETE CIRCUIT DIAGRAM

P, S & T, are the REL plugin receiving coils.
L1 & L2, are the REL (small size) transmitting inductances.
C1, C2 & C3 are Cardwell receiving condensers of 100, 150 and 500 micromicrofarads capacity respectively.
C4, C4—blocking condenser and grid condenser, 2000 μμfds. or thereabouts. The blocking condenser should have been tested at 1000 volts at least.
RFC Each 150 turns No. 26 on a ½" core.
R1 7-ohm rheostat.
R2 & R3 12-and 30-ohm rheostats. If receiving filaments are operated in series only the 30-ohm rheostat will be needed and will be placed on the panel.
G G—Altho two ground posts are shown, this is done for the sake of avoiding a confusing cross-line in the diagram. Actually there is but one "G" post—and that does not go to ground but to a counterpoise.
V1 0-10 volts D.C. Jewell
V2 0-500 volts D.C. Jewell
M.A. 0-100 mils. D.C. Jewell
A 0-1 ampere R.F. Jewell
R4 is the external resistor or "multiplier" of the 0-500 voltmeter. L3 is the absorption to which a microphone may be connected if speech transmission must be used.

The box is ply-wood, draped with leather and provided with a stout carrying handle. The inside dimensions are: length 18¾"; height 16"; depth 10½". Next the general layout was made and it was decided to use a wooden frame carrying three panels of 3/16" bakelite. The frame is of ½" x 1¼" whitewood and is described well enough by the drawings.

The three panels are as follows:— (see photo)

Meter panel (top) 18¾" x 4½".

Inductance shelf (carrying jacks for plug-in coils) 17¾" x 8".

Control panel (lower) 18¾" x 6¼".

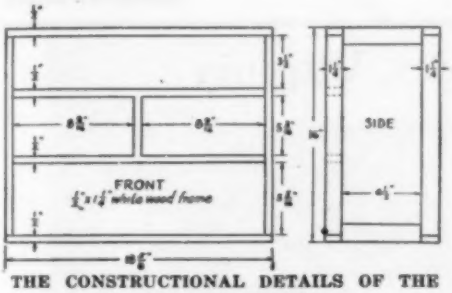
The three panels are rubbed down with oil and No. 000 steel wool. The sub panel or shelf is notched (1½" x 1¼") to permit the vertical post of the wooden frame to pass thru. The apparatus on the shelf is as follows: at the rear three Benjamin UX type sockets are mounted with their centers spaced 3½" and the middle one almost exactly half way on the panel and 2¼" from the rear edge. These holes are large enough to pass the body of the socket *with clearance* as the base of the socket is below the shelf. The instructions for mounting in this way will be found in the socket carton. At the extreme right of the shelf six ¼" holes are drilled to receive the jacks which hold the REL receiving coils, primary, secondary and tickler. Any coil can be exchanged independently of the others and with a set of 7 the entire amateur range above 12 meters can be covered.

The primary transmitting inductance is mounted in a fixed position at the left end of the shelf with the plate lead running to the right-hand end since that end is nearest the antenna coil. In front of the primary, 4 holes are drilled to permit flexible leads to go from the helix clips down into the set. The secondary or antenna coil is mounted by screwing a lengthwise bakelite strip of 3/16" bakelite to the secondary inductance. This strip is ½" wide and thru it pass a pair of 6-32 machine screws which in turn go thru a slot in the shelf and are each equipped with a spring washer and soldered-on nut to provide a little friction. The panel slot in this case was 3/16" wide and 7½" long, tho the length obviously depends on the adjustment that is wanted

*2ALS, Radio Engineering Laboratories, Thames Street, New York City.

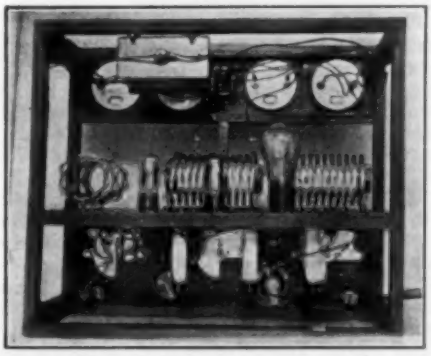
and also on the spacing of the two screws.

The apparatus on the meter panel is self-evident, but may be listed as follows from right to left, 0-10 D.C. filament voltmeter, ground post, 0-500 D.C. plate voltmeter, 4-pole double-throw Federal anti-capacity switch, 0-1 antenna R.F. meter, antenna post, 0-100 D. C. plate milliammeter.



THE CONSTRUCTIONAL DETAILS OF THE WOODEN FRAME

The apparatus on the lower, or control panel, is, right to left, phone jack, 150-μμfd. receiver regeneration control condenser, receiving filament rheostat, 100-μμfd. receiver tuning condenser, transmitter filament rheostat, 500-μμfd. transmitter tuning condenser and finally a key jack. The extra jack above the transmitter filament rheostat is connected to an absorbtion loop



REAR VIEW OF SET REMOVED FROM CASE

of one or two turns of rubber-covered wire wound around the grid end of the primary transmitting inductance. A microphone can be plugged into this jack—if you wish to degrade yourself in that fashion.

The R.F. chokes have wooden plugs driven into one end and are mounted with a screw driven thru the shelf. All three chokes are alike. The two fixed blocking condensers should be able to stand about 1000 volts. Across the grid condenser a graphite leak was used, but anything will serve that does not overheat—and stays in adjustment.

It is important to have the receiving grid condenser of small capacity as a large condenser makes it harder to get good tube operation at the short waves. In this set, the condenser has a capacity of 100 μμfds. and the leak has a resistance of 7-10 ohms.

All filaments are worked from the same 7.5-volt batteries, the receiving tube filaments (3-volt UX199 tubes) being protected by a semi-fixed 30-ohm rheostat in series with a regular 12-ohm rheostat.[1] The extra rheostat is mounted in the rear of the set, where the 500-voltmeter's "multiplier" resistance is also located.

Six flexible rubber-covered leads are taped together and run to the "power-house"

FRONT VIEW OF SET IN CASE

box containing the 7.5-volt A battery as well as the 90-and 450-volt B batteries for the receiver and transmitter respectively. Since the set will almost certainly be for automobile use it is worth while to think of operating the filaments from the 6-volt car battery[1] and possibly to supply the transmitter plate from a 6/350-volt dynamotor.

The complete job is still to be wired up. Flexible rubber-covered wire is best as it does not break or short-circuit.

The set is now ready to put into its case and as both sending and receiving circuits are familiar and time-tried everything should operate well at once, provided the antenna is of proper length. A single-wire 31-foot antenna and a similar counterpoise can be operated at their fundamental of about 40 meters or the primary may be tuned to 20 meters and the antenna system operated at its second harmonic. The lower

1—If the plate voltage does not exceed 350 the output of a UX210 is almost as good with 6 volts on the filament. The automobile battery provides this very nicely. The receiving filaments are safer when run in series—and the proper bias for the audio stage is then available. Tech. Ed.

(Concluded on Page 50)

Amateur Radio Stations

3AAI, Alexander, Virginia

THIS very neat layout is the low power crystal-controlled station of John S. Arnold of Alexandria, Virginia. Were it not for the indicating meters on the panels, it would be impossible to pick out the receiver from the transmitter, from a glance at the photograph.

The crystal oscillator is in the center. The panel of the oscillator (as well as the panels of the other parts) is of lacquered brass. The oscillator tube is a UX210 controlled by a crystal ground for either 76.4 meters (3929.9 kcs) or 42.8 meters (7015 kcs). Plate supply for the crystal oscillator and the power amplifier comes from "S" tubes and a step-up transformer, the normal plate voltage being 550. The supply is filtered by means of the home-made filter system under the operating table. A 45-volt C battery is used in the grid circuit of the crystal tube to obtain the proper grid bias for the oscillator.

The cabinet at the left houses two UX210's with their associated apparatus, comprising the power amplifier and frequency doubler. The plate voltage is 550. normally, supplied by the same power unit as the oscillator. The C-battery voltage on the power amplifier varies with the frequency in use at any particular moment. With two crystals and the frequency doubler, 3AAI can QSY to four different wavelengths, viz, approximately 21, 38, 42 and 76 meters(14280, 7890, 7139 and 3945 kcs. respectively).

Filaments of all tubes are supplied with current from a home-made filament transformer. The plate transformer is also home-made.

The antenna at 3AAI is a 3-wire flat-top 40 feet long and 65 feet high. The counterpoise is a single wire 40 feet long and 25 feet high. The station is located right in the midst of the business section, which considerably hampers Arnold's style. The counterpoise is strung right between two brick buildings!

The receiver is mounted on a separate table across the room from the transmitter, when not being photographed. The transmitter is "remotely controlled"! The receiver consists of a set of Aero Products plug-in coils and one stage of audio frequency amplification, mounted in a cabinet similar to the transmitting cabinets. A separate one-wire receiving antenna allows for break-in operation on all

wavelengths except that of the transmitter.

Notwithstanding the comparatively low power, 3AAI works 6's almost anytime at night, has worked g2SZ, m9A and other foreigners. For the past sixteen months Arnold has not missed over three or four nights at the set. Most of the work is done on the 38-meter wave. Truly an efficient little station arranged for maximum efficiency in traffic handling.

5AKN, Dallas, Texas

THE STATION shown in the illustration also goes under the name of 5XBH, but is probably best known under the 5AKN call. It was constructed by J. H. Robinson of 522 Cumberland Street, who is also owner and operator.

The transmitter changes circuits pretty often, as do lots of our amateur layouts designed mostly for experimental work. This particular transmitter lends itself to circuit changes particularly readily because the various parts of the circuit can be "gotten at" with ease.

The layout shown uses a UX210 tube as a master oscillator and a lone 50-watter as a power amplifier. Plate supply comes from a 1,500-volt Esco motor generator hid under the floor under the transmitter. A resistance in the positive lead from the M. G. furnishes the necessary drop for operating the UX210 power amplifier.

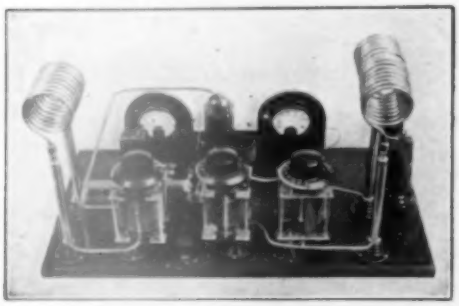
To the right are the wavemeters. Three are provided. One is a small interchangeable coil meter used for "clicking" the receiver to measure the wavelength of the received signal. Behind the small meter is another one which uses a neon tube resonance indicator. This meter is used primarily for tuning the transmitter somewhere within the 80-meter band. The larger meter uses a thermocouple and galvanometer for resonance indication. It is also equipped with removable coils. 5AKN is an O. W. L. S. hence the variety of meters.

To the extreme right, between the receiver and desk-stand telephone is the control box. Switches are provided for performing a number of operations on the transmitter and receiver. A switch at the top of the panel grounds the separate receiving antenna while transmitting. Below this are small double-pole double-throw switches which cut-on and-off the receiving tube, A and B supplies, the filament of the transmitting tube and the 110-volt line to the motor-generator. All switching controls are concentrated on this small panel where everything can be controlled easily without having to scramble all over the operating table to find a lost switch!

Although 5AKN's stationery does not admit it, we are inclined to believe that he works at the local Telephone Company. Note the moulded telephone receiver shells used to support the transmitting inductances, and the one on the wall right above the transmitter. hi!

1AAE, Pittsfield, Mass.

THIS is a father-and-son station, owned and operated by Warren S. and Charles M. Campbell. The station is located at 31 Boylston Street, and has been in consistent operation ever since its erection soon after the World War. The start was made with a 202 and Quaker Oats Inductance, using a direct coupled Hartley supplied with 450 volts, A.C. After going through the usual numerous periods of



changes and refinements the station takes the form shown in the photograph.

The set employs a 50-watt, low impedance tube in the tuned-grid tuned-plate circuit described in the March *QST* in the 6HM Station Description. After numerous attempts to correct a slight waver in an otherwise pure D.C. note (due to variations in line voltage) this circuit was found to correct the trouble, thanks to the complete dope furnished by Colonel Foster.

The plate supply is 1200 volts at the tube terminals, supplied by a 750 watt R.C.A. transformer and a 56 jar rectifier with lead and aluminum strips in 20 Mule Team Borax solution. The filter consists of a 100-henry choke and a 15-μfd. condenser. The inductances are of ¼ inch copper tubing, the turns being spaced a quarter of an inch. The tuning condensers are 43 plate Nationals that have been cut down to 23 plates and double spaced. The R.F. chokes in both plus and minus high voltage leads are untuned and consist of 100 turns of No. 30 D.S.C. magnet wire on 2 inch tubing. The center-tap arrangement consists of two Xmas tree lamps in series across the filament terminals. Each lamp is shunted by a 6,000-μfd. Micadon receiving condenser. All "hot" parts of the circuit are supported by General Radio standoff insulators.

Since the efficiency of the circuit depends on the inter-action of two coils spaced about 25 inches apart, the inductances were placed 12 inches above the baseboard so that their fields would clear the rest of the apparatus. The coils are fastened to the brass pedestals with unions such as are used in automobile gas lines. This gives extreme rigidity required for high frequency operation and makes quick waveband changes possible. Nine turns are used in both plate and grid coils for the 7500 KC band and three turns are used for the 15,000 KC band.

The antenna is a single No. 12 enameled wire in an inverted "L". The flat-top is 45 feet long and 65 feet high and the lead-in is 45 feet long to the set which is located on the second floor. The counterpoise is also a single No. 12 wire 40 feet long and 8 feet above the ground.

1AAE is in both the Army and Navy nets. The station turns in a good bag of traffic each month and the DX includes about everything workable on the face of the globe. The greatest pride, however, is taken in that crystal-like D.C. note which shows what can be accomplished with ordinary apparatus when a little horse-sense is combined with theory.

Strays

Two very excellent booklets have just been prepared on audio frequency amplification. One, called "Audio Amplification" published by the Samson Electric Company of Canton, Mass., contains a world of theoretical and practical data on the problems entering into the design of the audio frequency amplifying system, suggests many practical applications of a number of theoretical considerations, discussing fully the relative merits of the various types of amplification systems as well as "B" battery eliminators and reproducers. The other booklet is published by Silver-Marshall, Inc. of Chicago. This booklet is called "The Secret of Quality". The booklet starts off by stating the number of problems which enter into the audio frequency amplification system and progressively takes the reader through the theoretical solutions and the practical application of these theories. In this booklet, also, the various types of audio frequency systems are explained, their merits compared and the result of a tremendous amount of laboratory work on the audio frequency amplification is brought to light. "A", "B" and "C" eliminators are discussed, and full descriptions of several popular broadcast receivers are given. The broadcast fan cannot well get along without both booklets which cost twenty-five and ten cents each, respectively.

Calls Heard

u-1APL, 92 Lowell Street, Springfield, Mass.

a-2bb a-2ca a-2ds a-2kg a-2lm a-2rj a-2tm a-2tn a-2yi a-3bd a-3kb a-3ls a-5ah a-5bg a-5ma a-7hl b-b2 b-4yz c-5go c-5hp c-8ar c-8wm f-8ma f-8zo f-8yor g-2cc g-2qb g-5ch g-5ma g-5nn g-6kk i-1las p-3co p-3gb q-2mk v-dg2 z-2ae z-2ac z-4am z-4ak bz-1ab bz-1ac bz-1an bz-1ar bz-1ia bz-5ab.

1ayg, James Wood, 106 Pine Grove Avenue,

f-8bf f-8cs f-8fn f-8gi f-8ix f-8kf f-8zo f-8rbp f-8yor ocng ocnt p-1ae p-1ak p-2nh p-3gb n-pb3 n-stb n-owe (tts zero wc) i-1as i-1bk i-1fp i-1gw i-1no i-1ns z-2xa z-4ak z-4ac z-4am z-4wr ch-2ah ch-2ld ch-3ij m-9a m-1n 1-1jw b-j2 b-o2 b-z1 b-4qq b-4yz g-2cc g-2kg g-2qb g-2sz g-2xy g-5by g-5dh g-5lb g-5ls g-6bd g-6yd gi-2it bz-1ak bz-1aw bz-1bd zb-1ib bz-1bi bz-2aa bz-2ab bz-2af bz-2aj bz-5aa bz-5ab bz-9qa z-2bk w-2cs a-2tm a-3bd a-3cj z-3ef a-3kb earlo ear24 rxy keih ntt.

1cna, 94 Allston Street, Cambridge, Mass.

a-7cs bz-5aa bz-1aw ch-2ah f-8cs f-8kf f-8fcr f-8yor f-8jn f-ocng f-octn f-fw g-2it g-2lz g-2sr g-2qb g-2xy g-2vq g-5dh g-5ms g-6og g-6yd gh-1fg i-1co k-K7 p-1ae p-3or q-2mk n-pb3 n-pb4 y-1cg y-2ak agb age g-33 wnp nidk ntt kgbb hu-6bdl.

u-3lw, H. A. Robinson, Silver Lake Farm, Willow Grove, Penna.

6axw 6cii 6cpf 6cua 6xk a-2eg a-2es a-2dj a-2rj a-2tm a-2yi a-3bd a-3bh a-3en a-3ls a-3wm a-3xo a-4cm a-5bg a-5lo *a-6am* a-7cs a-7ew a-7dx a-7hl a-vis b-ft bz-2aj ch-2ar ch-2ld g-2sz hu-6bdl hu-fx1 i-1co p1-ae y-2ak z-1ao z-2ac z-2bx z-2gc z-2xa z-3ai z-3am z-4ac z-4am z-4av f-9c ido pjc nba niss not npc npu s7q val voq vyg wnp wxf xda.

4bt. J. Gray McAllister, Jr., Box 118, Montreal, N. C.

6adv 6agm 6ahn 6akm 6anc 6ann 6anp 6bav 6bbn 6beh 6bjl 6bjv 6bqt 6bxc 6bxd 6bxi 6bxr 6bya 6byz 6bzc 6bzm 6edv 6cej 6chl 6cng 6cqa 6cuw 6cwg 6eww 6dar 6dcq 6ddo 6fz 6hv 6ih 6it 6jn 6rv 6ms 6mu 6no 6np 6pw 6qi 6uv 6va 7av 7bh 7gm 7it 7nh 7ox 7pu 7tk 7vh 7vm 7wc 7wh hu-6axw hu-6dea hu-6xk 6zac a-2am a-2br a-2cg a-2lj a-2no a-2rg a-2so a-2tm a-3bna a-3dc a-3en a-3kn a-4bo a-4cm a-4dw a-5bg a-5bx a-5da a-5dx a-5lf a-5ma a-5nb a-5wh a-5zf a-6gb a-6kt a-6kx a-7dx a-7la b-4zz bz-5ab c-4dw c-4ek ch-2aw g-5dh g-6td m-cyy m-jh m-lg y-1cg z-1ao z-1ax z-2ae z-2bd z-2xa z-3ar z-3bh z-3mc z-4as z-4av vc6 kfhw lp1 ocdj rl voq wnp wvc.

5ani, Frank Watts, 1716 Park Avenue, Shreveport, La.

2it 4le 4az 4aad 4aah 4hx 4ix 4lq 4io 4lc 4iv 4jr 4fl 4fy 4mv 4jj 6cgw 6ayj 7it 7aki 8aty 8bca 8ckp 8ded 8kf 9aod 9ajl 9ajw 9auj 9aeb 9avb 9ara 9adr 9nox 9bdt 9bl 9bna 9bkj 9bug 9ccs 9cf 9ev 9ck 9dfg 9drs 9day 9dqj 9dwn 9ek 9ekf 9ep 9ft 9kd 9kau 9pu 9pz 9zt 9nr.

5DF, A. D. Mayo, Auburn, Alabama

1adw 1aqi 1avl 1beq 1cmp 1cvj 1py 1za 2aci 2aes 2afm 2apv 2aqw 2byg 2bdx 2crb 2cty 2cvj 2cuq 2exl 2gv 2kg 2mu 2nm 2nw 2on 2rf 2tp 2uo 2xi 2xai 2xaf 3acm 3blc 3bmz 3bq 3cdk 3ckl 3mv 3ot 3qp 6aou 6bav 6bcn 6bhr 6bqt 6cpf 6cuw 6bao 6bdk 6or 6oi 6pw 7uw 7mn 7bx 8aag 8agi 8ara 8atx 8amd 8amp 8apm 8aul 8azt 8bbe 8bbc 8bgw 8bkm 8buy 8baq 8dbm 8dc 8dce 8dpa 8dpl 8dia 8dqk 8dqz 8es 8gb 8of 8ot 8pl 8rt 8sx 8zae 9acl 9act 9aex 9afb 9ana 9aot 9ara 9arr 9awg 9ayd 9axo 9baz 9bdt 9bdq 9be 9bff 9bn 9bpw 9bpl 9bqa 9bre 9brk 9brq 9brj 9bxw 9cet 9cj 9ctg 9cuc 9cvn 9cvq 9cxc 9cxs 9cye 9cym 9ccys 9cyc 9cdz 9dap 9dbf 9dmj 9dng 9dol 9dpj 9dud 9dvf 9dwp 9dx 9dzs 9ebp 9ebw 9efe 9efk 9eky 9ebl 9eme 9es 9kg 9mn 9sw 9pg 9zt spc ocdj ag8 b-82 5zaz glq cv6 rxy c-1ar c-2cg m-jh m-9a.

5ww, W. W. Adams, Box 214, Center, Texas

1cc 1da 1fl 1gr 1ja 1uw 1xm 1xv 1yd 1aab 1add 1adf 1ahl 1aij 1amd 1aos 1apz 1axn 1ayj 1ayl 1bcc 1bcg 1bdp 1bhs 1bie 1bwi 1byx 1ccp 1ccw 1cib 1cqr 7av 7bb 7cs 7du 7fq 7gj 7it 7je 7jf 7jt 7mr 7nh 7ob 7pt 7pu 7pv 7tm 7uj 7uo 7ut 7uw 7wu 7ya 7adf 7aek 7ajb 7aro a-2ac a-2am a-2cg a-2cm a-2cn a-2cs a-2dj a-2ds a-2gw a-2ij a-2jm a-2lk a-2lm a-2mh a-2rc a-2tm a-2um a-2yh a- 2yi a-2yx a-3aj a-3am a-3bd a-3ef a-3kb a-3lm a-3lp a-3ls a-3ot a-3tm a-n3s a-4an a-4ca a-4cm a-5aa a-5ay a-5bg a-5da a-5kn a-5lf a-5lo a-6cj a-7cs a-7cw a-7dx a-7hl a-7lq z-1aa z-1ac z-1ao z-1ax z-1wu z-1xa z-2ab z-2ac z-2ak z-2bx z-2ga z-2xa z-3ac z-3ae z-3ag z-3aj z-3ak z-3az z-4aa z-4ac z-4am z-4av z-4mm c-1ar c-2ax c-3aj c-3bf c-3bl c-3by c-3cs c-3gg c-3jl c-3kp c-3mv c-3ni c-3xi c-4bf c-5cr c-5ef i-1or i-1no i-1ij j-joc j-1pp ch-2ah ch-2ld ch-3ag ch-3at ch-9tc pi-cd8 pi-1frm pi-1hr bz-ap bz-2aa bz-2ab bz-5ab bz-spc hu-6clj hu-6dbl hu-6buc pr-4ja pr-4rl pr-4sa m-1j m-1n m-9a m-bx m-js. Misc. agb dx8 kegk nkf nqg rxrd rxy vkn fw.

6bws-6byg, Russ Shortman, Jr., 721 West Jackson Place, Phoenix, Arizona

1aao 1are 2bbx 2bir 2exl 3bwt 3tq 3bnt 4bu 4rm 4tv 4we 4xe 4xj 5arn 5acl 5agu 5af 5mb 5eh 5oq 5za 5zai 7adm 7af 7pj 7jp 7jf 7ob 8aly 8box 8gx 8zg 9egg 9dbf 9dkm 9dvl hu-6buc hu-6aff a-2yi a-2cm a-2cs a-7cw z-4aa 20 meters: 1ga 3apv 6cgw 6ts 8crr 8pl 9bnv 5 meter band; 6cnc 6dai (pse qra 6dai?)

6arx, Raymond M. Moore, Box 1222 Hollywood, Calif.

a-2jr a-2tm a-3bd a-5xg ch-2ld ch-2ar hm kfhw voq vyg hu-6asr j-3kk j-8aa m-1m m-1n m-9a o-a3b o-a3e r-bai 1-ga2 z-2ac z-3ak z-4aa 73en.

6cct, 5529 Fleming Avenue, Oakland, Calif.

a-2cs a-2eg a-2yi a-3ao a-3bd a-3ef a-3en a-3ls a-3tm a-3xo a-4am a-4an a-4mm a-4rb a-5lb a-5lo a-7la e-arl ei-pk7 f-8ab g-2mn g-2ls g-2od hu-npm hu-6aff hu-6buc hu-6duc hu-2yi j-1aa j-1ts j-1pp j-3kk j-joc m-1n m-1aa m-9a m-bx m-cx41 r-aa8 r-af1 r-cb8 v-dl4 v-du4 x-2bg y-2ak z-1ao z-2ac z-2ae z-3ai z-3aj z-3ar z-3am z-4an z-4ac z-4ag z-4am z-4av pi-1hr pi-1dr sk2 dx8 kg vkn vqf au-7mn au-7kx au-7bw bam rxy rl wwdo npm npn npo npl npu npa noh nar nra naw nnc neqq kfuh.

7bb, E. R. Stevens, 703 North 50 St., Seattle, Washington
All in Daylight August 21, 22 and 23

1bwi 1aci 1cmx 1lw 1zw 1zy 2ate 2bur 2uo 2cty 3aha 3cdk 3zo 4rm 5aab 5afs 5agu 5arf 8amb 8dld 8azu 8bpr 8eq 8bti 8exi 8bre 8aul aa7 bb3 au-7bh hu-fx1 hu-wyl c-4aan c-4dq c-4du c-4cl a-2bb a-2ij a-2ip a-2yi a-2no a-4cm a-7aa z-4ac fw xam xda glq voq zbk du4 nar npm npn npa npg npl nkf nba npo b-4yz bam i-1rg r-cb8 y-1cd kfuh ug pe-6yx cs-ok1 fnd osla joc.

J. F. Keller, 400 Perry Street, Bucyrus, Ohio

a-2bk a-2cs a-2yi a-2tm a-3kb a-3ef a-3xo a-3yx a-5kn a-5bg a-7hl a-9or z-1ao z-1ax z-2ac z-2xa z-3ae z-4aa z-4ak z-4am b-4rs bz-2ab bz-2af bz-2ag bz-2aj bz-2ay bz-5ab bz-5ad bz-sql bz-rxy bz-1aw ear23 f-8fr f-8ix f-8jn f-8yor f-8kf f-octn g-2sz g-2nm g-5dh kagb m-jh m-1af m-1b m-1n m-9a n-pcll o-a4l o-a4x o-a3b p-3gb -3fz q-hik r-af1 r-ba1 r-fb5 y-1cd y-jcp fm-8mb fm-8ra gi-6mu wnp npm nisp niss nisr nisf not naw nna nnc nidk nba nvu nce ojqe ojqv kfih kdts kdeh xam dx8 lp1.

Frank Leis, 1940 Larrabee Street, Chicago, Ill.

1agd 1bex 1zk 2aix 2awq 2bgz 2ci 2go 2ms 3auf 3bwt 3ea 3en 3jf 3tc 4aah 4ei 4io 4jk 4la 4ll 4oa 4qb 5ace 5acy 5afg 5aih 5ajj 5akg 5akl 5aky 5ame 5ard 5ato 5aty 5bz 5dq 5ea 5ii 5jz 5uk 5wi 5yl 6ael 6akm

6ar 6az 6bav 6ggo 6js 6ku 6rr 6vz 7ae 7asb 7bb 7ob z-lax bz-2ab a-2cs c-9cx dx8 rxy.

u-9dbw, Paul E. Griffith, 118 College Avenue, Northfield, Minn.

a-2bb a-2bk a-2cg a-2no a-2cs a-2yi a-3bd a-5bw a-7cw a-vkp a-vis bz-2ab bz-spc ch-2ar f-8gi f-8yor f-octn g-2sz hu-fxl m-lg m-1j m-1n m-5c pr-4pr u-6zac z-lao z-lax z-2ac z-2ae z-2xa z-3ai z-3aj z-3ak z-4aa z-4ac z-4ak z-4am abg agc ftj gbk kgbb vyg wnp wwdo nunn npl npg niss nkf npu npm naw nar nba wva wvc wvz sp4 lpl abl cv6 gx9 g9y cx7 dx8 nao ngg wvy xda xam.

9duz, H. B. Miller, Mishawaka, Indiana

a-2yi a-2yx a-3as a-3cm a-3kb a-3wm a-4cm a-4cz a-5bg a-5da a-5nb a-5wh a-7dx a-7la b-4zz bz-1ac bz-2ab bz-2ae c-4dw c-8wm ch-2ar ch-2ld q-2bz m-1j m-1n m-5c z-lax z-law z-2xa z-3ak z-3ar z-4aa z-4ac z-4am cyy gbk jbox m-jh lp1 npu rxy spc vyg wwdo.

g2kk Radio House, Wilson Road, Smetwick, Staffs., England

1akm 1azk 1bzc 1co 1vw 1sw 1sz 1xv 1zd 2akm 2awz 2ax 2bnz 2cje 2cxl 2mu 2nz 2uo 2za 2zv 3blc 3wf 3wi 4an 4bu 4cv 4dt 4fj 4hs 4hu 4mv 4sq 5ado 5adz 5aka 5amd 5ame 5apm 5aqt 5arl 5arn 5dq 5fh 5fm 5gk 5gw 5rz 5sw 5uk 5ux 5za 5zai 6app 6apw 6aqg 6aqp 6asd 6ase 6auf 6avj 6aws 6awt 6bad 6baw 6bav 6bcs 6bfe 6bge 6bgo 6bgv 6bha 6bhz 6bis 6bjd 6bjv 6bjx 6bmw 6bol 6bon 6bpg 6bpn 6buc 6bvi 6cco 6csx 6et 6cuk 6cur 6dam 6dax 6db 6dh 6dl 6dn 6eb 6ec 6ew 6fz 6qg 6qu 6rh 6rj 6rm 6rn 6sb 6sz 6xaf 6xao 6zac 7ab 7av 7co 7do 7ek 7en 7eo 7ex 7gb 7ge 7it 7jf 7mp 7no 7nx 7ob 7os 7ox 7pi 7pt 7ri 7ut 7vr 7wu 7wv 8aj 8ajm 8amd 8anb 8aod 8atx 8ab 8cil 8csv 8ded 8rh 9aca 9adn 9ads 9akf 9am 9ara 9atg 9atq 9bmd 9bpw 9brc 9bvh 9bwb 9bzi 9cad 9caw 9cde 9che 9ek 9clj 9cxc 9dav 9deg 9dfy 9dgm 9dkm 9dpj 9mb 9no 9oo 9sd 9xa a-2cg a-2cm a-2cs a-2bk a-2ss a-2tm a-2yi a-3kb a-3my a-3ta a-3tm a-3ya a-4rb a-4bo a-7es a-7dx a-7dy c-4tg c-5ad c-5am c-5bn hu-6axw hu-6cfg hu-6dcf hu-6nb hu-6boa hu-6tq hu-c3n m-lk m-9a xam pi-1cw pi-3aa pr-4rd z-lax z-2ae z-2ak z-2bx z-4aw z-4am z-4av onem fb2 kel koa kegoknf npm nna ntt wis wnp wvc smaa sp tuk tulsa wva

g2BMM, K. E. B. Jay, 19 Elm Close, Amersham, Bucks, England

1aae 1aao 1aci 1adm 1aeq 1aff 1aga 1ajl 1ajp 1aoh 1arz 1asf 1aud 1avf 1avl 1ayt 1azd 1azj 1bcn 1bco 1bez 1beb 1boa 1bqq 1bus 1bxe 1cav 1caw 1cax 1ecz 1cek 1cjc 1cjh 1cmf 1cmp 1cmx 1ka 1kk 1ou 1pl 1qi 1ry 1vw 1xv 1zw 2aaw 2afo 2ahk 2aim 2akv 2amj 2arm 2asa 2aue 2ayj 2bbx 2byg 2bxj 2cjd 2crb 2cty 2cvj 2cyx 2ff 2gy 2iz 2id 2ls 2mu 2od 2pf 2se 2sj 2tr 2uo 2va 3acf 2acm 3afq 3ahl 3bel 3bgs 3buv 3bva 3bwt 3lq 3mq 3zo 4by 4ea 4hx 4hy 4in 4it 4jz 4kj 4kw 4mi 4ni 4oa 4oc 4qc 4qy 4si 4wa 4xc 5amn 5ee 5hz 5kc 5mq 5qi 5wi 8anj 8abm 8ada 8ahc 8ajr 8ame 8atv 8bay 8bce 8bfo 8bni 8box 8bpl 8bth 8buy 8bxe 8cen 8chp 8dgo 8dgy 8ew 8jq 8kf 8zae 9aek 9avj 9bpb 9cwz 9ckc 9ek 9eev 9eez 9egh 9gx 9mn pr-4ja pr-4dx c-1ar 2-alm z-lax z-2ac z-3ai z-3ak z-3arz-4aa z-4am bz-1ak bz-lax bz-1bh bz-1bl bz-2aj r-db2 m-1n m-9a cgb keau lpi nba nkf nip niss vis voq vyg wgy wiz wnp wvc xam

Jack Perdue, 212 Victoria Avenue, Windsor, Ontario, Canada
80 Metre Band

4aae 4aah 4al 4bd 4bf 4bq 4bx 4by 4cu 4ea 4ekb 4fa 4fj 4fl 4fs 4ft 4fw 4gl 4gy 4hl 4hu 4iq 4it 4ja 4jk 4kl 4kb 4kw 4mi 4ni 4oa 4or 4ou 4pf 4pz 4qb 4rr 4ry 4sa 4si 4tu 4tz 4va 5aad 5ace 5acy 5adk 5ado 5adz 5ae 5aga 5agf 5ags 5aip 5ak 5ama 5amn 5apg 5apm 5apo 5atk 5atp 5atv 5atx 5avz 5ax 5cgt 5cwq 5ed 5eh (hl) 5eew 5fb 5gs 5jf 5gs 5kc 5eg 5mq 5mk 5ol 5om 5pc 5ph 5pk 5gl 5rh 5rw 5sr 5sw 5tc 5uk 5va 5vu 5wi 5za 5zai 5zo 5zas 6afs 6aji 6akx 6bhz 6ble 6bpg 6bq 6bvo 6cal 6cqa 6cto 6cuc 6dag 6dan 6ddo 6eb 6mb 6oi 6tk 6uk 6uf 6xao 6xi 6zb 7ek 7ge 7kr c-3mv c-3jw c-3he c-3fc c-2be c-4bt.

OA3X, George N. P. Allaway, 146 Umbilo Road, Durban, So. Africa

1qp 1aao 2xv 5ql 6xk 6cgp 6bpg 6bmw 6ddo 6cgw 8dju 9drs 9egh 9ejl bz-1ao agc and agb idg pepp andir b82 tuk npm npo suc fel rcrl 6nd.

C. Conte, 24 Allee du Rocher, Clichy sous Bois, Seine et Oise, France

1aal 1aao 1aay 1aff 1ana 1awe 1bez 1bie 1buo 1bvl 1caw 1cca 1cez 1cib 1cmb 1cmf 1cmx 1cnz 1cpi 1di 1dp 1gr 1jy 1mv 1my 1on 1rb 1rc 1uw 1vw 1xv 1xk 1zw 2aaw 2aes 2adm 2amd 2asq 2atc 2avg 2brb 2byg 2edy 2eyd 2eyx 2gv 2mu 2nf 2pr 2rv 2tb 2tr 2uo 2xaf 2wh 3afq 3auv 3bva 3cyn 3cmn 3cpo 3nu 3ot 3afu 3tr 3zo 4anz 4ee 4ha 4if 4lk 4mao 4nh 4pu 4pi 5wi 8ada 8ahc 8ade 8bbe 8bni 8brc 8bre 8ccq 8cdv 8cug 8owp 8bpd 9dk 9eyi 9kd 9kg naw nidk niss not nwp wna c-1am c-1ar c-2be c-3ay c-3kp c-3by c-8wm m-jh m-1k m-1n

y2AK-y1BR (ex yJCP) Juan C. Primavesi, Box 37 Montevideo, Uruguay

1ao 1aao 1aiu 1alr 1bbj 1blf 1ch 1ci 1cib 1ckp 1cmp 1cmx 1mv 1xv 1zq 2aao 2ahm 2acp 2amj 2aqw 2apv 2crb 2crd 2cgb 2ff 2gk 2ld 2zx 3aha 3go 3hg 3op 3oz 4eu 4iz 5akn 5aw 5em 6cbp 6cg 6ckv 6rn 8aly 8cca 8cau 8don 8dmz 8kpc 8adk 8ado 9axq 9bdq 9ekr 9xi 9zt a-3ef a-4an b-4yx bb-7 f-8ca c-8cp f-8jn f-8kf f-pe g-2bz g-2ce g-2it g-2ts g-5dh g-5lb g-5nj g-6og hu-6axw i-1er i-1gw j-3aa mlaa m-1j nofp n-pc2 p-1ae pi-1bd s-2co s-2nm z-2ac z-2xa

a3SR, J. Sullivan, 58 Shoohra Road, Elsternwick, Melbourne, Australia

1aao 1aci 1aep 1af 1aw 1axa 1bep 1bei 1blf 1bzc 1cal 1cmf 1cmg 1cmp 1cnp 1co 1pr 1te 1yb 1yd 2ag 2ahm 2anm 2au 2av 2ay 2bgi 2cb 2cua 2gk 2kg 2nz 2uo 2wc 2xaf 2zv 3awa 3bmz 3buv 3bwj 3ca 3cjn 3ef 3gk 3lw 4ak 4bl 4cu 4jn 4oa 4rn 4sa 4tv 4xj 5acl 5ado 5adz 5agn 5agu 5aky 5alz 5aq 5atg 5atv 5aua 5auz 5av 5dl 5em 5he 5jd 5jf 5nj 5nw 5oq 5ov 5pa 5rg 5uk 5yd 5zai 6amm 6abg 6abj 6adt 6ahp 6aji 6ajm 6akm 6akw 6akx 6alt 6akp 6asv 6at 6aus 6awt 6axw 6bav 6bbc 6bbv 6bgo 6bgq 6bhz 6bil 6bis 6bjd 6bkh 6bls 6bmw 6bol 6bpg 6bq 6bta 6bua 6bvo 6bwi 6bye 6cae 6cbb 6ccl 6cee 6cgk 6cgw 6chi 6chs 6cix 6ckx 6ckv 6clj 6cmd 6cmg 6cmu 6cnc 6cnm 6crs 6ct 6cte 6cto 6cub 6dag 6dal 6dan 6dcq 6ea 6eb 6hm 6hv 6jn 6jq 6kb 6kd 6kw 6ky 6mb 6nx 6ny 6oi 6pa 6pr 6qd 6qu 6rn 6rw 6sb 6sv 6ts 6ud 6vz 6xad 6xg 6xi 6zbe 6zr 7aah 7aaj 7ay 7es 7df 7dm 7ek 7hb 7if 7lj 7lq 7pf 7tm 7to 7vh 7wu 7xe 7zx 8aax 8adg 8adm 8aly 8anb 8ayy 8bau 8bc 8bce 8bhm 8bit 8bpl 8br 8bt 8dgp 8dqu 8dqz 8gx 8kw 8pl 8rt 8ve 8xau 8xe 8zk 9ad 9adn 9axp 9bbf 9bbw 9bdw 9be 9bht 9bj 9bta 9bvh 9bwb 9eby 9ees 9ehe 9ek 9eld 9en 9eox 9epm 9ev 9ex 9db 9ded 9dht 9dng 9dog 9dpg 9dpl 9dqu 9dre 9drd 9ebp 9eez 9eii 9eji 9ek 9elt 9fj 9hp 9ua 9wi 9xi 9xn 9zt c-3xi c-4gt fi-8qq f-8pm g-5lf hu-6ajl hu-6aff hu-6ajl hu-6bue hu-6cst hu-6dbl hu-6def hu-6zac i-1wr j-1kk j-1ts j-1sq m-jh pi-1au pi-1hr r-cd8 r-1cm pi-3aa.

a3WM, W. J. McAuley, Union Street, Brunswick, Victoria, Australia

1aao 1aiu 1apz 1bdp 1bzc 1cmf 1cmp 1cmx 2agq 2kx 2mk 2mu 3auv 3chg 3hs 3lw 4eo 4bl 4gy 5aky 5amn, 5eh 5kk 5uk 5zai 6aak 6afs 6akm 6baf 6bgv 6bhz 6bq 6bxd 6cae 6ccl 6cgw 6cky 6cto 6cuk 6kb 6vh 7aaj 7ay 7gb 7nh 7no 7rl 7tk 7zm 8adm 8alo 8bce 8bgn 8dqz 8kw 8pl 8xe 9avj 9bac 9bbf 9bmx 9bsz 9bta 9bvh 9cde 9che 9clr 9cpq 9cxc 9ded 9dka 9eas 9eji 9ekf 9eli 9elt 9hp 9mb 9wi 9xa 9xi 9zt f7 Alaska 7mn; b-d4 bz-1bd c-4gt c-3kp c-1ar car 23 car 31 f-8jn f-8jc f-8ix f-8kfc f-8tk f-8jz g-2cc g-2kf g-2lz g-2nm g-2sz g-2od g-2qb g-5dh g-5nn g-5hs g-5lf g-5sz g-5tx g-6ju gi-2it gi-5nj i-1ay i-1gw i-ntt j-1aa j-1pp j-1kk j-joc k-ki8 m-1aa m-1b m-9a m-jh n-ohb n-pb3 n-pb7 s-2nl pi-1au pi-1cw pi-1dl pi-1hr pi-cd8 pi-3aa pi-nnb fi-8qq fi-hya pr-4sa Borneo vqf, Panama nrk, Java andir, Tahiti bam, China ffz Palestine 6yx, 6zk hu-6clj hu-6aff hu-6buc hu-6ajl hu-6dbl.

S. W. Hecker, Camp Street, Temora, N. S. W., Australia

1pl 1yb 1te 1aep 1rg 1bb 1fq 1ht 1fx 1rm 1ha 1px 1ka 1aa 1tu 1agh 1aac 1aat 1cmp 1cmx 1ahg 1bzc 1aq 1fr 1pld 1uw 1li 1aao 1axa 1bux 2lu 2agt 2lz 2qi 2li

2th 2xaf 2xs 2bbx 2cxw 2gy 2aq 2re 2ds 2ahm 2ic 2sb 2wc 2xv 2rv 2acs 2aan 2xbf 2aim 2kg 2anm 3ot 3bva 3kw 3oi 3ac 3bw 3ju 3ef 3sc 3ckl 3bwj 3ld 4gi 4al 4gt 4tm 4rm 4mi 4ate 4eco 4tv 4cm 4si 4ry 4sb 4fl 4tn 5aj 5agl 5uk 5ng 5er 5zai 5gr 5rfb 5ew 5agz 5akz 5in 5agn 5vn 5aav 5za 5jf 5ae 5ls 6aji 6aij 6aoi 6ahq 6awt 6an 6agk 6ank 6af 6aqp 6bhz 6bjx 6bao 6bmw 6baz 6bcf 6bs 6bm 6ba 6bq 6bil 6bbv 6bqr 6bbj 6cso 6cj 6ct 6cgw 6cix 6dah 6cuk 6on 6fa 6jp 6lj 6ot 6rw 6tx 6ut 6uar 6xqb 6zbe 6xad 6cmg 6uc 6qad 6dai 6chs 6btm 6bgo 6ew 6ais 6bav 6cz 6ajl 6kb 6asw 6dnb 6kx 6xi 6ccl 6oi 6ctd 6hm 6alt 6hv 6jn 6dbe 6dl 6ac 6bjl 6cvp 6boo 6ctg 6cgk 6dam 6aiv 6cgn 6sv 6apk 6bon 6ckl 6aak 6bav 6js 6pr 6qu 6ctc 6ahp 6auf 6htt 6cdw 6np 6bpg 7uz 7ay 7wu 7ek 7aaj 7lq 7fq 7rl 7df 7gb 8akf 8aj 8bc 8bf 8ca 8cyi 8ct 8er 8gz 8pl 8ry 8dns 8alf 8bnh 8dvi 8bn 8dia 8xe 8kw 8sd 8aly 8eb 8dem 8cme 8afq 8bt 9ake 9ack 9ado 9bht 9bby 9bbj 9ccq 9cgn 9ck 9ded 9dux 9dvr 9eht 9li 9nx 9rh 9uc 9ek 9cld 9xb 9dng 9eky 9ebj 9kal 9eli 9bzi 9eji 9hb 9zt 9jh 9gx 9bjx 9dwp 9bmx 9bwo 9dqu 9wi 9cpq 9fj 9cpm 9cpk 9doq 9btr hu-fxi hu-6clj hu-6aff hu-6asr hu-6buc hu-6bdl 6oa f-8jn f-8ee f-8xxo pi-1hr pi-1au pi-1d pi-1cw pi-3aa pi-cd8 r-cb8 m-9a ch-1eg ch-9tc c-3aa c-4gt c-5go g-2kf g-2od g-2nm g-2lz g-2cc g-2sz g-5sz g-5si g-5lf g-5nn g-6nf g-6uz g-6lk j-1kk pr-4rl pr-4sa fi-8qq fi-8lbt n-pell n-pcuu n-pcpp n-stb n-pb3 p-1ae gi-5nj pe-6zk e-ar21 o-a3x i-1ax k-agb npm kie npj pkx ane andir anf fnd fnk fw npo lpz npm npu vmg 6zac rrp nrrl aqe gbe nve geft nry nifj kfuh vzbw kegk. Unknown—wvy noen neqq f8z mjh 8pm b82 muu ira eteav pk4 9hg 9wj wghm 6xy lpv.

Frederic J. Barnett, F. M. S. Railways, Gemas, Ded. Malay States

2ac 7it 7mf 7mt 9lx 7ho 7lq 7tm 7wu 6cmg 6bpg 6ckv 6dcq 6nd 6xc 6xav 8ec 6pr 6axq 6cmg 6bbq 6bdl 6cwk 6rw 6bjx 6ctx 6abg 6by 6cto 6btm 6clk 6bg 6dat 6bq 6alt 6alv j-1kk j-1dx j-8aa j-1fm j-3ax j-1zq j-1ts j-yo z-2bx z-2ac z-1ax z-2xx a-3xo y-2bg pcpp pell pcmm niss agb suc ocdj.

Pacific Division Convention

EVERYTHING is all set for the Pacific Division A.R.R.L. Convention to be held at San Jose, California, October 15, 16 and 17, 1926. While a few details have not been settled at the time this is being written, these will be settled definitely by the time this is in print.

Accommodations have been provided for four hundred to be in attendance and by all indications the attendance will run over the mark. This is an A.R.R.L. Convention and will be run as such.

San Jose is fortunately well situated as a center of amateur activities on the Pacific Coast, there being a total of over a thousand licensed amateur stations within a radius of one hundred and fifty miles. Then too, having a large tourist hotel such as the Hotel Vendome, where the convention will be held, with all the facilities for handling such gatherings, helps to add to the inevitable success of the coming convention. In fact, the Santa Clara County Radio Association, under whose auspices the convention will be held, feel that they were especially fortunate in securing this hotel. Especially so, in view of the fact that they are securing accommodations at a rate less than half the price paid by other large conventions and gatherings at the same hotel in the past.

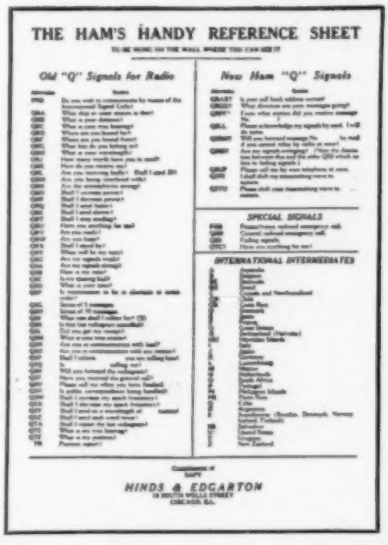
Some of the names on the program of speakers are nationally-known radio authorities, among them being: A. A. Hebert, A.R.R.L. Treasurer, of Hartford, Conn., Mr. Kolster of the Federal Telegraph Co., Lieut.-Col. Robert Loghry, Signal Engineer, Ninth Signal Corps Area, U.S.A., and in charge of the radio intelligence service in France during the war; Gerald Best, Technical Editor of *Radio;* D. B. McGown, Radio Inspector of the Sixth District; A. H. Babcock, Director Pacific Division A.R.R.L.; Col. Dillon, Radio Supervisor Sixth District; Mr. Butler, engineer of the E. T. Cunningham Co.

Another means of making this convention attractive to the hams, is the fact that the reservation fee has been placed at the low figure of $3.50 which covers all convention activities, the 'big feed' and entitles the holder to the reduced hotel rates. The rates of the hotel for the delegates may be secured for as low as $1.50 per night.

—*E. A. W.*

Strays

We ran a stray in the September issue telling you of the handy little cards Hinds and Edgarton of Chicago were giving to the hams, on request. Unfortunately there was a "bull" in their address. This month we are running a reproduction of their latest—a *large* sheet of Old and New "Q"



Signals, Special Signals and International Intermediates. These sheets are printed with letters large enough to be read at some distance. They can be hung on the wall of the shack and are about the handiest thing we know of for the operator to consult. Later ones have "R" system. They can be obtained with the compliments of the publishers, Hinds & Edgarton, 19 South Wells Street, Chicago, Ill.

CARRYING on from last month's I.A.R.U. News Department we are adding hereto three additional countries to the list of foreign DX data.

Country	Wavelengths Assigned	Best DX Band	Best Time (GMT) For QSO U. S. A.	Traffic Handling allowed
So. Africa	0 to 200	30-42	2200 to 0700	Only "experimental"
Brazil	80-85 40-45 18-24 4-6	32-36	2200-0000 and 0700-0900	Yes
New Zealand	120-150 70-75 0-37	30-37	0330 to 1440	Yes, if does not complete with Government owned telegraph Svc.

The best U. S. waveband for QSO with any of the above countries is the so-called 40-meter band.

France

"The French Section of the I.A.R.U. elected its officers last month. They are as follows: Honorary President, Lefebvre, f8GL; Presidents, Leon Deloy, f8AB and P. Louis, f8BF; Vice-Presidents Levassor, f8JN and Le Blanc, f8DE; Secretaries, Martin f8DI, Mezger f8GO and Audureau, f8CA. Mr. Levassor who presided over the meeting, mentioned the pleasure it gave all amateurs to have Mr. Louis and Mr. Deloy accept presidencies. The new officers of the R. E. F. composed a message of friendship to all French members and foreign groups. The R. E. F. includes all amateurs interested in the transmission and reception on short waves. Its official paper is the "*Journal des 8*", known all over the world. Its aim is to help promote amateur work and it requests everyone to assist it by joining and working with the R. E. F. In spite of its being a holiday time, there are still many hams at the key. The receiving is still good in spite of the season, and static is rare, generally speaking, U. S. stations are extremely consistent in the morning from 2 to 6 G. M. T. The signals of the powerful station f8JN are heard very QSA by fc8GG in Shanghai, China. The French settlement in Shanghai also boasts of the stations fc8AG, fc8EM and fc8ZW. All of these stations transmit from 20 to 24, G. M. T. on wavelengths between 33 and 35 meters. f8JN has also been QSO the U. S. ships NISS and NUNX. Richard Jamas (fi8QQ) the well-known amateur in Saigon, Indo China, has just been given the official call ic1B (Note—radiogram received at A.R.R.L. headquarters from exfi8QQ says that the Government of French Indo China has adopted the intermediate "IC" for all amateurs in that country—J. M. C.) OCBV is the call of the French Military Station in Beyrouth, Syria. The QRH is 58 meters."

—*J. Reyt. f8YOR*

Holland

"Although the Dutchers are still troubled by the Government, they do not QRT, but continue to do good work. During the great Radio Exhibition in the Kurhaus at Scheveninger, an I. A. R. U. meeting attended by more than 70 hams was held. It was decided to hold Saturday Night Prayer Meetings on 90 meters. oCO is preparing for the coming 5-meter tests. oWC tries to keep his daily schedule with u2CVJ and has been in touch with South Africa. oEP and oPM continue to work good DX. oPX keeps his tubes hot by relaying messages for Honolulu and Hong Kong. oWB after working the U. S. and the Antipodes and blowing many 50 watters is rebuilding now. STB returned to his first love, 1000 meters. PCTT, PB2, oWF, oUC, oF3, oRT, oAM, oAX, oNL2, oGA and oKV work Europe and occasionally some DX. oQX, after being confiscated, hopes to be on the air again soon, after having paid his license fee. PB3, PB7, PC2 and oRO seem to be able to work every station heard. oKH was the first "N" to hook KEGK. Our Section continues to grow rapidly although only a few of us are licensed."—*C. de Beaufort, Traffic Department, Dutch Section, I.A.R.U.*

Ireland

"It does not seem to be known generally that Ireland consists of two countries, namely; Northern Ireland, and the Irish Free State. The Northern Ireland hams are under the control of the British Post Office, and use the intermediate "GI", while the Irish Free State, or Southern Ireland, gang are under the control of the Irish Free State Govenment and use the intermediate "GW". Southern Ireland calls commence with the number followed by one letter, i.e. 11B, 12B etc., while Northern Ireland calls are issued in the same manner as British amateur calls. In Northern Ireland plenty of good work has been done. gi2IT has been QSO about 44 countries and all six continents since October last and has put good phone signals across to Brazil, U. S. and Canada. He has also worked ANDIR, Java, being the second British station to do so. gw5NJ continues to QSO Australia, New Zealand and South Africa, and lately has worked Argentina. Phone sigs have been put across to Australia, Canada and Brazil. gi6MU is at present on a volage from Ireland to Canada and back, and contact was maintained easily all the way across the Atlantic each night with 5NJ and 6YW. 6YW uses an input of 6 watts and is one of the best low power G's. He holds a record by *raising and working* Porto Rico on 2 watts, and on this power he has also been QSO U. S. and Canada regularly. This is hard to beat. In Southern Ireland, no station at present uses more than 10 watts input but excellent work has been done. 11B and 18B have both worked the U. S. more than once and 19B has worked all Europe on 3 to 5 watts. Other excellent low power work has also been done, there is not space enough to give details. Reports for Irish Amateurs whose QRA's are unknown may be sent in the meantime c/o W. R. Burne, 34 Dame Street, Dublin, Ireland."—*F. R. Neill, 5NJ.*

South Africa

By the time these lines are in print and in your hands, the Rand Daily Mail *Springbok* contest will be in full force. Look up the last issue of *QST* and in the I.A.R.U News Section you will find dull details governing the contest. The "U's" are urged to cooperate fully with the South African boys. The Springbok is a trophy well worth having, and the contest is going to be a good one. Don't forget the QSL cards.

"Conditions in South Africa are improving as the winter draws near. "U" stations are coming through with good strength. QRM from the States is very bad, at times it being impossible to separate some stations. A good deal of experimental work is being carried out by our boys. We do not have large numbers, but where we lose out in number we more than make up in the energetic manner in which all of the South African amateurs tackle various problems. oA4V, oA3B, oA5X and oA3K of Johannesburg are always on the air. oA4Z, oA6W and oA4L are also consistent workers and between them have done a great deal of DX work. World-wide reports of long distance daylight work are starting to come in. It is easily possible to keep communication day and night at all times throughout South Africa in the 30-to 40-meter band. oA3E of Durban has been doing good work with the U. S. A., QSOing the Sixth District in daylight. I hope that the New Zealanders and Australians will please take note that the "O's" are anxious to establish communication with these countries. New Zealand is about our only "dead" country now. A good time for QSO with the Z's from South African stations would be 0600 G. M. T. The S. A. R. R. L. is now on a good sound footing and on good terms with the Government. The county has been divided up into 14 Districts, each having its Divisional Headquarters. Raymond Coombs of Johannesburg was the founder of the League and is the Organizing General Hon. Secretary. Conditions in South Africa for reception are very favorable, although at times QRN abounds. We do not suffer from QRN, though, nearly as much as our South American friends. For the information of the U. S. amateurs in particular, South Africa, contrary to many ideas is not such a wild and savage country as many are led to believe. We are a progressive country, quite modern, and it is hoped that the band of American tourists who have just been through the country will arive back in the States saying, "we were agreeably surprised."

—*R. Oxenham, oA4L*

Arabia

A new station in what is probably a new country was speared recently when Jackson of 1CMP worked tjCRJ whose QRA was given as J. Rockall, Amman, Transjordan, Arabia. The QRH of CRJ was 36.8 meters and the note a pure D. C. one. Shortly after this QSO Borden of 1CMX was QSO CRJ who repeated the QRA as above. Later 1ALR was QSO CRJ, also.

Russia

1CMP and 1CMX both worked AZUT recently. This station is located in Esthonia, near Petrograd, Russia and is the experimental layout of a prominent engineer in Russia. The QRH at the time of QSO was about 32.5 meters. His input, we understand, is around 50 watts.

Borneo

Two new stations in Borneo have been QSO'd by a number of "U's". They are

bnSK1 Barnes Kuching, Sarawak, Borneo and bnSK2, Gray Kuching, Sarawak, Borneo.

Belgian Congo

A new one, station bcF2, Robert, TSF, Kinshasa, Belgian Congo, Africa has been QSO'd by several British amateurs. u3JW reports hearing him working g2TO and g2NM; u2AVB reports hearing him work g2TO, and g2VJ has worked him several times. g2VJ also reports working 1CW in Tripoli.

Java

Ashley Dixon of u7IT worked PK7 in Samarang, Java, who sends the following account of amateur activities in Java; "There are practically no hams out here but we have lots of atmospherics. BCL's hear Japanese and Australian stations, and Manila comes in F. B. every night. There are eight hundred or a thousand B. C. L.'s but only 3 or 4 hams who have installed transmitters. Receiving as well as transmitting is strictly prohibited by law. Most hams have calls like mine, PK and a number. There are now PK0, PK1, PK7 and PK8. All QSL cards can be sent to me (forwarded via A.R.R.L. Headquarters). PKO (ttszero) transmits regularly from 1140 to 1340 G. M. T. every Tuesday and Thursday on 22 meters. PK7 has increased his input to ten watts and has been QSO the U. S. every night afterwards. He uses two Phillips 201-A tubes for transmission, with a plate voltage of 300 obtained from B batteries. The circuit is a Meissner. PK1 is now on the air in the 40-meter band with a 5-to 10-watt input."—*PK7*.

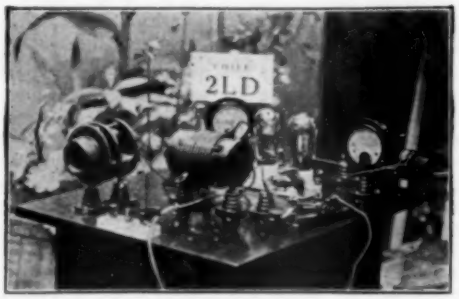
7IT is only one of a number of U. S. hams to work the PK fellows.

West Africa

Well, boys, here is something else to shoot at. Edwin Cozzens who is on the Presbyterian Board of Foreign Missions at Ebolowa, Cameroun, West Africa recently visited his relatives in California and has just recently sailed again for West Africa with both short wave transmitter and receiver along. The station will be put in operation shortly after his arrival in West Africa. Unless prohibited by the Government he will use a call PM with the intermediate fo—tts foPM. He will anchor somewhere near 33 meters and is VERY anxious to establish as many contacts as possible, particularly with U. S. gang. If the French Government assigns him a call he will use foPM followed by the call. The transmitter is a 50 watter operating from a 1,500-volt dynamotor. The transmitter and receiver were assembled by some of the Sixth District fellows and was given a thorough test before Cozzens sailed. Remember the call, foPM, keep an ear open for him and give him a QSR whenever possible.

Chile

We are reproducing herewith a photograph of station ch2LD, the well-known outfit belonging to Luis Desmaras of San-



ch2LD THE INTERNATIONALLY KNOWN CHILEAN STATION

tiago de Chile. The tubes are UX210's, there being two of them. Plate voltage at 400 is obtained from the city lighting mains. The circuit is a coupled Hartley affair. ch2LD's DX is world wide.

Dutch West Indies

2LE and 2APV have worked PJD who uses a "de" as an intermediate. PJD gives his QRA as St. Martin Island, Dutch Indies, an island due East of Porto Rico.

Indo China

fi8QQ, Richard Jamas of Saigon, French Indo-China sends us a radiogram saying that the Government has decided that intermediate for Indo-China will be "IC", and that fi8QQ's new call is ic1B.

Italy

"Although it is only a short time that Italian amateurs have been operating transmitters, considering the results that they obtain every day we think that Italy is now one of the countries showing the greatest activity and most interest in amateur radio. This is due largely to the wide scope of activities of the A. D. R. I., the Italian Experimenters' Association founded in November 1924 by several Milanese amateurs. At the outset the activities of this Association were devoted to the problem of obtaining official recognition from the Government, as up to that time all Italian amateurs were obliged to work secretly. The first Italian Transmitters' Competition was organized in November of 1924 and with the contest the first licenses for amateur transmitters, and a number of fine prizes, were obtained from the Government. The results of the

contest were highly satisfactory; more than twenty Italian stations were received in America on the 80-meter band, and with 50-watts input to their transmitters. Before then no Italian stations had reached across. Since then the number of A. D. R. I. members has increased so greatly and proportionately that one can notice the remarkable progress amateur radio has taken in this country. The American hams who participated in the Paris Congress held in April of 1925 will remember the great number of Italian amateurs who were present. The interest and part they played in the formation of the I. A. R. U. is also a matter of radio history.

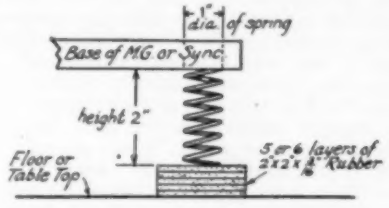
"At that time they were already representing the only European association with the same aims and organization as the A.R.R.L., and already had their official organ called, *"Bollettino Mensile Della A. D. R. I."* which is the only Italian magazine "devoted entirely to amateur radio". The Government recognized the importance of the association, and caused it to give the official call signs to transmitting stations. Lately a committee composed of Government authorities and amateurs studied proposed regulations which will govern the operation of amateur stations. The A. D. R. I. is well known by amateurs and foreign associations for the important relay and QSL service that it gives. We are sure that these lines, appearing in the official organ of the greatest radio association of the world, will make the Italian experimenters and their Association better known."—*F. Pugliese, Gen'l. Secy., A.D.R.I.*

Spain

"The number of licensed transmitting stations in Spain has passed the 40 mark. During the past two months, however, work has been almost at a standstill due to the terrible heat. Only three or four stations have been in operation consistently. EAR20 and EAR1 have no trouble in working all countries of Europe and EAR1 has been QSO the U. S. during the past two weeks. He has also worked z2AC and z2AE. The majority of the fellows are QRT, though, and no new activities will be initiated before Fall. The EAR Association has proposed the granting of station licenses and call letters to receiving stations. The proposal has been well received by the amateurs, and should do much toward helping the progress of amateur radio. The EAR association has been responsible for the formation of a number of Morse Code instruction classes in various cities in Spain. The bulletin *"EAR"* is the official organ of the Spanish Section of the I. A. R. U. It is owned and directed by Miguel Moya. The bulletin does much to bring the amateurs of Spain (and of the whole world) into closer contact with each other. A Transmitting Contest is to be organized for 1926-1927. The EAR Association is fostering the contest whose object will be to establish with Spanish amateurs, and later America, the Philippines, Cuba and Porto Rico. The contest will start on October 1st and will be conducted as follows: Merits of individual stations will be judged on (1) two-way communications with the greatest number of countries, and (2) the greatest number of individual two-way communications. Power to be used will be that which is officially authorized. The wavelengths to be used will be those established at the first International Amateur Congress, including the experimental band. The EAR Association will publish the results of the contest as the contest progresses. Those amateurs who are interested in the contest should write the "Association E. A. R., Seccion Espanola de la I. A. R. U., Majia Lequerica 4, Madrid, Spain."—*Miguel Moya*

Strays

9BHS suggests the scheme shown here for cutting down the QRM from a vibrating M. G. set or a synchronous rectifier:



ONE OF THESE PLACED AT EACH CORNER OF M.G. OR SYNC.

Captain Rex Durrant, late GHH1 of Mosul, is now located at the Radio School, Royal Air Force, Flowerdown, Winchester, Hants, England. The station call is GFA and is in regular operation on 43 meters. Captain Durrant will be glad to receive QSL cards at the above address.

8BSS lives on a chicken (poultry) farm. They raise a new kind of chicken. By violet ray treatment they make the young chicks grow so fast they can produce full grown fowl in five minutes. If broilers are desired 8BSS has to run for the hatchet and work fast to keep the chickens from dying of old age.

Correspondence

The Publishers of QST assume no responsibility for statements made herein by correspondents

What Do You Mean, "Short Waves?"

Oakland, Calif

Editor, *QST:*

Perhaps it has occurred to the brotherhood that the term "short waves" doesn't really mean what it says. Take the BCL who slaps in a small coil and manages to pick up the 180-meter stuff—why he is "short wave." Then there is the bird who grabs a pile of apparatus and with great difficulty manages to work at 40 meters—he's "short wave".

Yes, its all short wave, but some of us who have done some work at 5 meters, and under, wonder what to call the thing—we have to say "short wave" too. Its tough. Let's classify the stuff. We are the only ones to do it.

We all agree that 200 to 600 meters should be called the Broadcast Spectrum. Then there isn't anything particularly funny about the waves from 60 to 200, let's call this region the "Conlite Region". Below this, daylight DX shows up very noticeably; perhaps we can call it the "Prolight Region", the lower limit of which is not sharply defined. Perhaps this region would be between 10 and 60 meters. Below 10 meters we could talk about "short waves and below 1-meter we might talk of "low waves".

Don't laugh; the idea is we need a classification of some sort. It is suggested that the term "Low Waves" be given some job as the above to get rid of it for a while; its ambiguous. Let's adopt something, even though it is temporary.

Yes, we *do* need a classification. What have you? —*A. Binneweg, Jr., 6BX*

A. C. Hum

No. Charlotte, N. C.

Editor, *QST:*

We have recently been confronted with a problem which though relatively small, was nevertheless considerably annoying and it is likely that the readers of *QST* will benefit by a brief account of our trouble.

As soon as our new short wave receiver was installed in the shack, we noticed a very pronounced A. C. hum which marred reception and at first we were unable to locate the source of the trouble. After the following changes were made the hum was absolutely eliminated.

The house is wired throughout with black and white covered wire, the white wire being grounded and the black wire being "hot". We had installed a double pole single-throw switch as a main cut-out and also had a snap switch as a main cut-out and ating switch. This latter one was wired-in in the white (grounded) wire, and gave all the trouble. As soon as the leads were changed over, putting the snap switch in the black wire lead, all trace of hum disappeared until the main cut-out was opened, when it reappeared. We have since found that the State code of wiring does not permit the white wire being broken by a switch, therefore a double-pole single-throw switch if used as a main switch, should have a jumper around the grounded side. Without a jumper a switch of this kind is dangerous in a line. —*G. C. Brown*

Cheap Logs

Oberlin College,
Oberlin, Ohio.

Editor, *QST:*

A very convenient and inexpensive log book, which adapts itself beautifully to the type of work most stations are doing, can be bought at any book or stationery store. It is bound in heavy canvass, corners leathered, and contains about one hundred and fifty pages of high grade paper, 8 by 12 inches in size. The pages are ruled horizontally and vertically, the latter being of special interest. This book, all prepared for use goes under the name of a double-entry ledger and costs about eighty cents. —*E. W. Thatcher, 8ZE*

QSLs Via Department of Commerce

Office of Radio Inspector,
Customshouse,
San Francisco, Calif.

Editor, *QST:*

Amateurs throughout the country are sending cards to the office of the Supervisor of the Sixth Radio District, requesting that they be forwarded to the various amateurs, and neglecting to enclose postage to cover the same. As there is no fund available for such postage, and as they cannot be

forwarded under the official penalty stamp, there is no way in which they can be handled. If the regular postcards are enclosed, or the postage included, we shall be very glad to accommodate them. Otherwise no action can be taken.

—J. F. Dillon, Supervisor of Radio

Hi!

650 California Avenue,
Venice, California

Editor, *QST:*

We quote verbatim a little gem from the "Voice of the People", the column of The Los Angeles Daily News—a column where all fanatics of any sort may ride their hobbies in the public eye.—"Los Angeles: The radio broadcasting situation in Los Angeles is a peculiar thing. If you don't believe it, just move within a stone's throw of one of the big stations and then try to tune that nearest station out on a Sunday morning. It will be a great day when this business is regulated by Uncle Sam .....Interference."

Realizing the devotion of your excellent periodical to the public weal, we should welcome a movement sponsored by you, for the introduction of a law regulating static, power leaks and wave propagation. Such a movement, we are sure, would be greeted with shouts by the radio fraternity.

—C. S. Gleason, 6CJQ

QSLL

597 North James Street,
Hazelton, Penna.

Editor, *QST:*

If the subject will bear more discussion in *QST* may I have a few words? I would like to have some one point out to me what earthly good a QSL card is anyway. At one time they carried some information. A few usually supplied all that was required to draw conclusions—a carload complicated matters.

Today the cry is "artistic" and original design. The original idea (as I see it) has been lost. Even so, what is the necessity of a written confirmation of something everyone tells you the minute you QSO? Where do fellows rate the slurs, etc., on their cards, intended to force the recipient into answering or being a bum in the eyes of the world? How many cards have you seen that carried QSC? Nil here. Small matter as compared to how QSA a wabbling QSB is in China.

My idea is this: if the QSLL hounds would spend some more time improving their fists and ears, not to mention general operating practices, Ham Land would be a better place to live in. Since we cannot convert all, the second best bet, if you are bent on papering the last room in the house with cards, is to have double cards printed and stamped. One card carries the information you desire to give and the other carries questions as to what you desire to know, with spaces to be filled in. Whatever stand you take please put 8BQ down on your Black List as not QSLing, and send your cards to me. For a QSR or test—F.B. OK QRV GA.

—Herb. Walleze, 8BQ.

Central New York Convention (Atlantic Division)

ALTHOUGH this annual convention was only a one-day affair this third annual ovent held in Utica on August 29th at the Hotel Utica under the auspices of the Mohawk Valley Brass Pounders proved one of the best held so far.

The arriving hams were greeted loudly by J. Alton Fitch, 8BCW on a Bosch horn, which made every one feel at home, and immediately tin whistles were in evidence.

After visiting six of the best stations, and by the way all of them were designed for efficiency, the gang returned to the hotel for a quick lunch preparatory for the afternoon session which started with a moving picture of, "The Wizardry of Wireless" through the kindness of the Radio Corporation. Later, another film from the Western Electric Co., called, "The Audion" showing what takes place in a vacuum tube, was shown. Both pictures were enjoyed by everyone.

The General Electric Company again showed its co-operation by sending, Mr. J. M. Kendall, one of its Radio Engineers who gave very interesting information on R. F. feed lines. And Doc. White (New England Div. Director) was present with his pocketful of tricks which, if used by the fellows, would put the manufacturers out of business.

The evening session consisted of a mighty good dinner supervised by G. H. Pickett who introduced A. A. Hebert, A. R. R. L. Treasurer, as principal speaker,

Timely remarks were also made by Chas. H. Schrader, President of the M. V. B. P. and Dr. Elliott White. Miss Mildred Jordan, entertainer of station WIBX, contributed to the pleasure of the evening by rendering a number of very good selections.

Dean Wallace, proved himself a good chairman for the convention and we are all thankful to him for making it possible for the League members to again get together this year.

The Rochester fellows showed up in such large numbers that they obtained the convention for next year, and we are promised great things. Do your planning now fellows!

—A. A. H.

A Portable Transceiver

(Continued from Page 37)

edge of the same bands can be reached a bit more conveniently if the antenna and c.p. are shortened somewhat.

The set alone weighs under 30 pounds. The writer took it to Hartford and back to New York on an especially hot and sultry day with no more difficulty than if carrying an ordinary suitcase. The tubes were in place and on return everything was found to be in good condition altho once during the trip the carrier ran violently into a concrete wall while looking—but that isn't radio.

Amateurs All Over the World

prefer

The ADVANCE

"*Sync*" RECTIFIER

1. The ADVANCE Sync Rectifier actually does what any other rectifier claims to do.
2. Can be easily and quickly filtered.
3. Meets all requirements for heaviest duty.
4. Speedy starting because of Advance Bakelite wheel.
5. Requires no attention—always ready.

Its prevailing use in international transmitting is evidence that, although lower in price, the advance Sync Rectifier is superior in quality.

Revolving disk is moulded bakelite six inches in diameter. Nickel plated brush holders with adjustable gauze copper brushes. Convenient control handle. Disk, aluminum brush arm support and brush holders perfectly insulated.

Price complete with Westinghouse ¼ H. P. Synchronous Motor $40

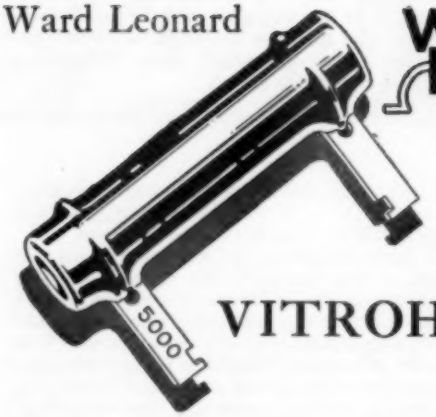
Rectifying wheel with complete brush assembly and mounting ring to fit your own motor $15

We Pay All Transportation Charges in U. S. A.

ADVANCE ELECTRIC COMPANY

1260-1262 West Second St., Los Angeles, Calif.

Ward Leonard



VITROHM

The resistor units you need for

VARION

Raytheon and AmerTran Battery Eliminators

Not affected by moisture, continuous service or overload. Wire wound, vitreous enamelled (gloss like) the permanently reliable resistor. Non-inductive; zero temperature co-efficient. Compact; easy to use; hard to break.

All sizes you need; seperate units; or handy kits of units, totalling 21,750 ohms in various resistance. Recommended for all approved A. C. and D. C. eliminators. 34 years manufacturing of resistance as specialists.

Ward Leonard Electric Co.

Mount Vernon, New York

7131-5

Again • we lead!

HUDSON short wave RECEIVER

PROVED BY THE AMATEURS TO BE THE BEST THING FOR THEIR POCKETBOOKS - WRITE FOR COMPLETE LIST OF MERCHANDISE THAT CAN BE BOUGHT ON DEFERRED PAYMENTS -

Hudson Radio Company

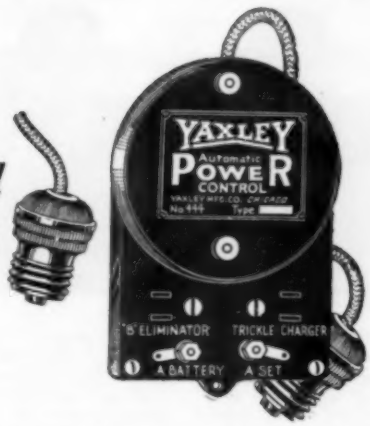
2118 - 61st ST. BROOKLYN. N.Y.

$15.00 DOWN Balance Monthly

YAXLEY
APPROVED RADIO PRODUCTS

Automatic Power Control

A Wonderful Convenience



Absolutely Fool-Proof

The Yaxley Automatic Power Control is undoubtedly one of the greatest advances in radio convenience, satisfaction and economy ever offered to you.

The Control is for the set using a trickle charger and B eliminator or either. The Control automatically cuts off your trickle charger, cutting in the A battery and B eliminator when the switch or filament control of your set is turned on. When your set is turned off the B eliminator and A battery are cut off, cutting in the trickle charger again. Easily wired in series with the A battery (either polarity). Does not disturb the wiring of your set at all.

The Automatic Power Control is the result of 25 years experience in the design and manufacture of relays. Voltage drop is negligible. Self-cleaning, silver wiping contacts. Handsome enameled metal case, with Bakelite base.

No. 444 Automatic Power Control, Series type, for use with sets for tubes having a resistance equal to or greater than 6 U. V.—199 tubes. . . Each $6.00

No. 445 Automatic Power Control, Multiple type—for use with sets having tubes with a resistance lower than that equal to 6 U. V.—199 tubes. Each $5.00

At your jobber or dealer. If he cannot supply you, send his name with your order to

Yaxley Manufacturing Co.

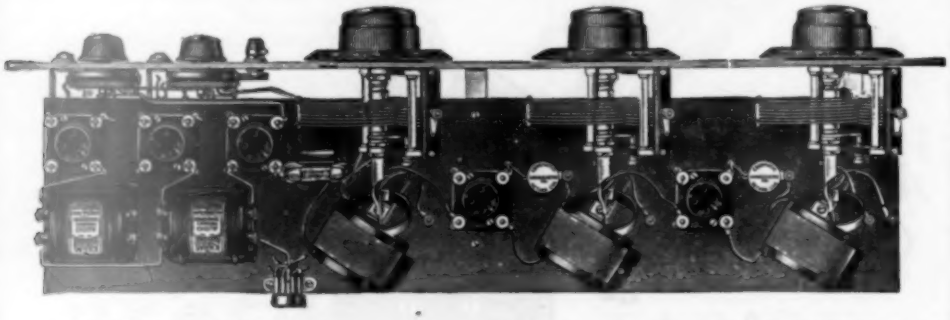
Dept. S, 9 South Clinton Street

Chicago, Ill.

The New Karas Equamatic*

Now Being Featured by Radio Broadcast

Fulfills in an extremely simple manner a very desirable and HIGHLY IMPORTANT FUNCTION that our foremost radio engineers have been striving to accomplish ever since the advent of radio broadcasting. THE EQUAMATIC SYSTEM AUTOMATICALLY provides a CONTINUOUS MAXIMUM and an absolutely EQUAL TRANSFER OF ENERGY between primary and secondary inductances at all wave lengths by a coupling system unique to radio engineering practice —it also eliminates the overlapping of electrostatic and electromagnetic fields with their harmful, broadening and distorting effects.

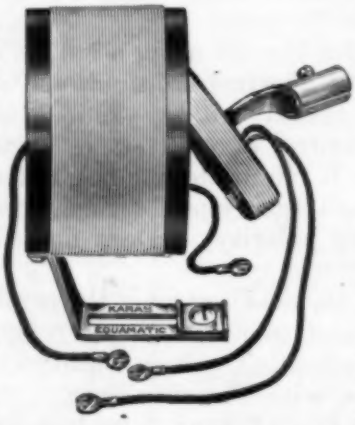


Pure Tone—Great Volume

The result of the EQUAMATIC SYSTEM from five tubes is a clean, clear, pure and powerful signal—equal in VOLUME to the usual six and seven tube sets—sharpness and SELECTIVITY equal to the superheterodyne—SENSITIVITY equal to a regenerative circuit—and a PURITY of tone equal to a crystal detector.

How It Works

In the EQUAMATIC SYSTEM the primary coils are attached to the shafts of the condensers —and are adjustable in their relation to both the condenser shafts and the secondary coils. The primaries are also ENTIRELY SEPARATED from the secondaries. The secondaries are adjustable to any angle in relation to the primaries and also as to their degree of coupling with the primaries. The primaries are AUTOMATICALLY, constantly and CONTINUOUSLY varied—at a definite, ever-changing rate of variation—with the turning of the condenser dials.



This POSITIVE, AUTOMATIC action provides the ABSOLUTELY EXACT amount of coupling—at every wave length setting—necessary to deliver to the secondary coils EXACTLY the amount of energy required to cause the tubes to constantly operate at their HIGHEST EFFICIENCY.

The Reason For It

In order to keep radio tubes CONSTANTLY operating at their highest efficiency—just under the oscillation point—it is absolutely necessary to continuously maintain an EQUAL TRANSFER OF ENERGY between primary and secondary coils. In order to maintain this equal transfer of energy, every wave length setting must have a DIFFERENT AND EXACT coupling between primaries and secondaries. To secure PERFECT reception, every successively longer wave length requires a greater transfer of energy—therefore a correspondingly greater degree of coupling — than the preceding shorter wave length. The problem has been to provide this exact and constantly varying coupling by some simple mechanical means. The EQUAMATIC SYSTEM solves this problem—does it POSITIVELY, SIMPLY and AUTOMATICALLY, and does not resort to ANY losser methods whatsoever. On account of the extremely high efficiency of this system the reception from a home built five tube KARAS EQUAMATIC receiving set is as nearly perfect as radio reception can be with present day knowledge.

Easy to Build

A manual of complete diagrams and instructions for building this five tube KARAS EQUAMATIC receiver in complete detail is included with each set of KARAS EQUAMATIC coils. (This manual will be sent separately upon receipt of 10c to anyone interested). The placing of every part and every wire connection is clearly explained. Even though you may never before have built a set you can proceed without hesitation, confident of successfully constructing as efficient a receiving set as can be made. To build this powerful, sweet toned, long range receiver, you will need the Karas parts listed on the accompanying coupon.

Karas Micrometric Dial

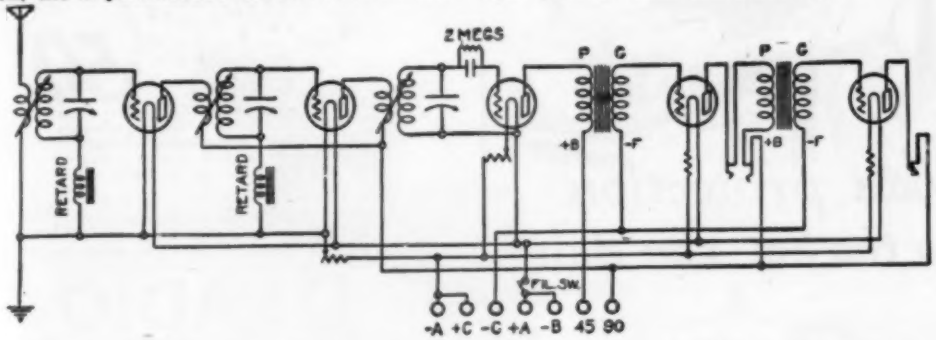
Because of the sharp tuning qualities of this set and the greater number of stations brought within range, Karas Micrometric Vernier Dials are ESSENTIAL to satisfactory operation. In these dials there is NO back-lash and none can ever develop. A light touch on the vernier knob and the dial moves INSTANTLY in either direction. Rough tuning is done with the larger knob, hairline work with the smaller. The vernier ratio is 63 to 1. In the 180 degree type, used on the KARAS EQUAMATIC, there are 200 divisions precisely placed, and marked with gold inlay. Overall diameter is 4½" and the knobs are usually large to give complete freedom from finger cramping when tuning for several hours at a stretch.

Five Tube Receiver Sensation

Solves All Tuned R. F. Difficulties

The EQUAMATIC RECEIVER develops greater SELECTIVITY without distortion or loss of the higher musical notes and their harmonics. All of the radio frequency circuits of this receiver are in PERFECT BALANCE at all wave lengths and once adjusted, the EQUAMATIC RECEIVER cannot howl or disturb nearby sets.

The life of both "A" and "B"" batteries is greatly lengthened because maximum efficiency can be obtained at lower filament voltages. This also lengthens the life of the tubes. The first tuning dial can be easily synchronized with the other two.



Karas Orthometric Condenser

The sharpness of tuning of KARAS EQUAMATIC receiver is due in large part to the efficiency of the Karas Orthrometric condensers used. The radio experts, editors and experienced fans choose these condensers for ANY type of set they may be building. The shape of the plates gives straight frequency line tuning and the 100 broadcast wave channels are equally spaced one division apart over a 100-division dial. Losses are extremely low because of brass tuning plates and end plates, soldered connections, pig-tail and placing of the hard rubber support strips.

Karas Equamatic Coils

The other factor in sharp tuning is the EQUAMATIC coils. Designed according to the very latest known FACTS for efficient handling of radio frequency currents, they pass an EQUAL and MAXIMUM amount of energy from primary to secondary at ALL wave lengths. The fields around secondaries are small and compact, and show little tendency for interaction. The adjustments possible in the coil mounting permit one to readily find a point of zero coupling between these secondaries. The primaries are sturdily built and mounted, and KARAS EQUAMATIC coils will not change characteristics from ordinary handling or temperature and humidity changes.

Karas Harmonic Transformer

Harmonic Transformer was the original high quality audio frequency transformer passing all audible notes and harmonics nearly equally; it has been unsurpassed by any subsequent development at ANY price. The wonderful reproduction and powerful volume of the EQUAMATIC RECEIVER is due largely to the use of two of these transformers. With Karas Harmonics there is no muffling of sounds—no fuzz on the edges of words—no thin, squeaky, distorted tones. Instead, every tone is clean-cut, separated and distinct from every other tone. Natural!

This even amplification of ALL audible frequencies is the result of scientific design. Larger coils containing many thousands of turns of wire give an unusually high inductance. Karas coil construction results in a low distributed capacity insuring full amplification of high audio frequency harmonics and overtones. Complete shielding prevents interaction and two of these units can be placed close together without distortion.

The output of EQUAMATIC RECEIVER is a smooth flow from the loud speaker of rich, round, full, mellow tones such as you have never before heard from any radio—a surprising volume of real music to which it is a delightful pleasure to listen.

Order Through Dealer or Direct on This Coupon

The Karas apparatus essential to the construction of the five tube EQUAMATIC RECEIVER is carried by nearly every good radio parts dealer in most cities. Secure the parts from your dealer. If he is out of them, order direct from us using this coupon. Send no money. Just hand the postman purchase price plus a few cents postage.

Licensed Under King Patents Pending

KARAS ELECTRIC CO.

Manufacturing Plant: N. Rockwell St.

Offices: 1077 Association Bldg., Chicago

Karas Electric Company,
1077 Association Building,
Chicago, Illinois.

Please send me 3 Equamatic Coils ($12), 3 Special Orthometric Condensers with extended shaft ($21), 3 Micrometric Dials ($10.50), 2 Harmonic Transformers ($14), 2 Karas Retard Coils ($2.00) and 3 Special Brackets ($0.70). I will pay the postman $60.20 plus postage upon delivery. It is understood that I have the privilege of returning any of this apparatus for full refund any time within 30 days if it does not prove entirely satisfactory.

Name .....

Address .....

If you send cash with order we'll ship this apparatus postpaid.

"Don't Guess
Push the Button—see!"

Add protection
to the Set You Build
A
Sterling
PANEL METER

No. 1647
Panel Voltmeter with push-button built in.
A combination for measuring "A" Battery and "B" Battery voltages. 0-7½ volts and 0-150 volts with scale division of ¼ volts and 5 volts respectively.
Price $5.00

No. R-644 A. C. Voltmeter especially designed to measure voltage across tube filaments when operated on alternating current. Invaluable for mounting in equipment used by transmitting amateurs. Scale: 0-15 volts ½ volt div.
Price $6.00

Here is the watchguard of your batteries and tubes. Mount it on the panel, push the button and see the condition of your batteries at a glance. Aids reception by proper filament adjustment and protects tubes.
It sure dresses up the set—a battery and tube insurance policy besides!

Sterling
PANEL METERS
are made for all purposes and capacities.

Ammeters, voltmeters, voltammeter, combination voltmeters and milliammeters.

With or without push-buttons.

PRICE $3.00 to $5.00

Ask your dealer or write us for folders

THE STERLING MFG. CO.
CLEVELAND OHIO

CROSLEY

Single dial
5 TUBE
Control
$50

Solid Mahogany Cabinet — drum station selector — highly selective thru new "accuminator" feature — all-metal chassis shields units — marvelous volume — power tube adaptability.

Other CROSLEY RADIOS - *from* 1 tube Pup *at* $9.75 *to* R.F.L.-90 Console *at* $90.
PRICES SLIGHTLY HIGHER ON WEST COAST

RADIO

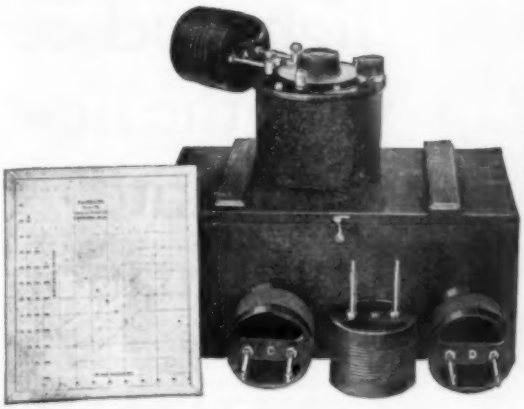
Write Dept 18 for Catalog
CROSLEY RADIO CORPORATION
CINCINNATI
Licensed Under Armstrong U. S. Patent No. 1,113,149

REAL BARGAINS:
NEW AND PERFECT:

UP-1656 Filament Transformers, 75 watt, 7.5v with midtap. $6.00; UP-1658, Filament Transformers, 150 watt, 10v with midcap, $8.00; UV-712 Audio Amplifying Transformers, 9-1 ratio, $1.50; UC-1831 4000v variable Transmitting Condensers, $1.50; UC-1803 Antenna Coupling Condensers, 10,000v .000025mfd., $1.00; Genuine Holtzer-Cabot No. 4 Headphones, 2200 ohms, double pole, high grade, $2.50; Genuine Cardwell Type 123-B Variable Condensers, .0005 mfd., $2.00; Signal R-48 Telegraph Keys, $2.25; Jewell O-15 AC Voltmeters, $6.50; Jewell 0-100, 0-200 or 0-300 milliameters. $6.50. Send for Catalog. UC 490 Filter Condensers, 1750v 1 mfd., $2.50; UC-1014 Grid Condenser, 3000v, .002 mfd., $2.50; Mica Condensers 1000v, .001 mfd., 25c; Bakelite Navy Key Knobs, 25c; Cutler-Hammer Variable Grid Leaks, 25c; Amrad 2796 Lightning Switches mounted on 5 inch porcelain posts, $1.50; Day-Fan Balanced Vernier Condensers, 7 or 13 plates may be used, Bakelite ends, $1.00; F.F Battery Charters, 110v, 60 cyc. Charges 6 amp. rate, $8.00; UC-1820 Variable Air Condenser, .0005 mfd., $1.00; PR-539 Filament Rheostat, .5 amp. 33 ohms max, .50c; AMRAD Circuit Breaker Adjustable around 10 amps. $1.00; General Radio Power Rheostats, 3½ amps. 50c; Stevens Spintite Socket Wrenches, 3 in set, 50c; Murdock Variocoupler with dial, 50c; Holtzer-Cabot 5 point Filament Control Jacks, 25c; Roller-Smith Radiation Meters, 0-5, $3.00; Vibroplex improved Japanned, $15.50; Vibroplex Nickeled, $17.00; Western Electric 349-BW Microphone, $4.00; B-T Short Wave Tuner, $3.50; Acme Choke. 1 henry 100 Mills., $1.00; Binding Posts per Doz., 50c; Day-Fan 43 Plate Condensers, 50c; Battery Hydrometers, 50c; Fixed Crystals, 25c. Walbert Filament Lock Switches, 25c; Fleron Stand-off Insulators, 8 inch, 75c; Marco Series-Parallel Switches, back mount, 25c; Church Automatic Templates, 25c; RCA Double Phone Plugs, 25c; Marco DPDT back mount, 25c; W. E. Condensers 21-K, 21-U, 75c. *25% deposit on all C. O. D. Orders. All items under 4 pounds Post-paid.*

NEW ADDRESS
STATE RADIO COMPANY
228 Weld St. Roslindale, Mass.

NEW GENERAL RADIO
Apparatus for Amateurs



Type 358
Amateur Wavemeter

This instrument is particularly designed for amateur use in checking wavelengths. Consists of a coil mounting directly on the binding posts of a shielded condenser of 125 MMF capacity. A small lamp serves as a resonance indicator.

The 358 wavemeter is supplied with 4 coils, a calibration chart and wooden carrying case.

The coil ranges are as follows:—

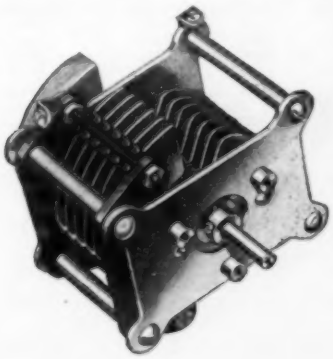
Coil A .....14 to 28
Coil B .....26 to 56
Coil C .....54 to 114
Coil D .....105 to 224

Wavemeter complete ....Price **$22.00**

Type 334-T and V
Transmitting Condensers

The types 334-T and V condensers are similar in appearance and assembly to all other Type 334 condensers except that they have double spacing for use in short wave transmitting on voltages up to 2000. They have metal end plates with shielded rotor. Plates of the rotor and stator groups are soldered to insure perfect electrical contact. The type 334 transmitting condensers are supplied with counter weights only.

Type 334-T Capacity 100 M.M.F. Price $4.25
Type 334-V Capacity 50 M.M.F. " 3.75



Quartz Plates for Amateurs

Plates are available in the 150-170 meter band, giving second harmonics in the 80 meter and fourth harmonics in the 40 meter band. The only licensed plates available to amateurs.

Price $15.00

GENERAL RADIO CO., **Cambridge, Mass.**

GENERAL RADIO
INSTRUMENTS

HALCO
MAIL ORDER SERVICE
For Radio Transmitting Equipment

HALCO Mail Order Service places at the disposal of the Radio Amateur a comprehensive and prompt source of supply for modern Radio Transmitting Equipment. HALCO Service is directed by amateurs, and hams buying from it are dealing with an organization that thoroughly understands their problems and needs. Whether you live right in Boston or 3000 miles away, Halco will save you time and money.

TOBE TRANSMITTING CONDENSERS

The TOBE Transmitting Condensers are made with the same care and scrupulous attention to detail as the TOBE Bi-Pass, filter and high-voltage power pack type condensers. Each transmitting condenser is tested and labeled with date of test and initials of tester. Capacities are guaranteed within 5% of ratings.

1,000-volt condensers are fitted with heavy brass binding posts. 2,000-volt condensers have heavy brass binding posts with petticoat insulators. Each condenser is cased in a heavy silver finished metal case.

The ideal condenser for transmitting plate-supply use. Packed singly.

Capacity Mfds	Prices Type No.	1000 volts	Type No.	2000 volts
.1	1001	$1.50	2001	$2.50
.25	1002	2.00	——	——
.5	1005	3.00	2005	$4.00
1.0	1010	4.00	2010	$4.75
2.0	1020	6.00	2020	$8.00

We sell the TOBE Vacuum "Tipon" Leaks and the TOBE Veritas Resistors,—capable of carrying 5 watts continuously and recommended for transmitting grid leaks.

DE FOREST TRANSMITTING AND RECTIFYING TUBES

We are agents for the De Forest Transmitting and Rectifying Tubes.

H Tubes $18.00
The new 150 milliamp - 2,000-volts H. R. Rectifying Tubes .....each $16.00
The D-9-R Rectifying Tube—100-milliamps at 500 volts $8.50

NEW DE FOREST D-9 TRANSMITTING TUBE

Maximum output—15 watts, maximum plate voltage 550, filament voltage—7½, filament current 1.6 amperes. **Price $9.00**

ACME APPARATUS FOR CRYSTAL CONTROL SETS

Acme 200-watt power transformers .. $16.00
Acme 1.6 Henry—115 milliamp. Chokes $10 each
Acme L-1 Inductances ..... $ 8 "

Send for special folder on Acme Transmitting apparatus.

THE HALCO SHORT-WAVE SET

We have developed a new short-wave receiver of particular efficiency and neatness of design and will gladly send descriptive literature to anyone interested.

Send for our catalogue sheets on transmitting equipment.

Any of the above items will be sent you promptly on receipt of your check or money order. Specify clearly in your letter whether you want shipment by express or parcels post.

HALCO MAIL ORDER SERVICE
132 Hanover Street **Boston, Mass.**

Operate your radio set from the light socket with the new Balkite Combination

ASK YOUR RADIO DEALER

QUALITY DONGAN PRODUCTS

Important Announcement

For the New Raytheon A B C Power Unit for the 199 Tube

USE DONGAN

Transformer No. 2561
Choke . . No. 1591

Be sure to get information on Dongan B-Power Parts for various types of filament and non-filament type tubes.

LIST $4.50

Type H Super Audio Transformer

The audio curve of this remarkable transformer is uniform; even lower frequencies can pass without distortion. Not only will your set get exceptional volume but a new clarity of tone.

See your dealer or send us order direct
Special Transformers for Trickle Chargers

Dongan Electric Manufacturing Co.
2999-3001 Franklin St., Detroit, Mich.

TRANSFORMERS of MERIT for FIFTEEN YEARS

It's Here O.M.!

We give it to you after
3 years development

Try the No. 130

REL Short Wave
Receiving Kit

Wavelength 10 to 206 Meters

It's a worthy companion to the other well-known REL products. Every part has been expressly selected and the entire design made from the actual experience of hundreds of "Hams."

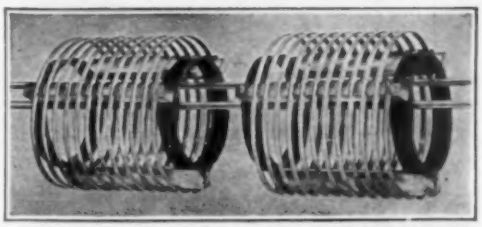
SOME FEATURES

Seven REL small size plug-in coils.
Coils are rugged and moistureproof.
Special low capacity double spaced variable condensers.
Non-metallic friction vernier controls eliminate grinding noises.
Four inch rubber extension handles on both controls positively eliminate body capacity.
Large visible scales engraved directly on panel.
Very easily assembled and wired.
Front panel completely assembled with condensers and vernier controls.

It's a short wave sensation built by the pioneer short wave experts

KIT PRICE $36.00

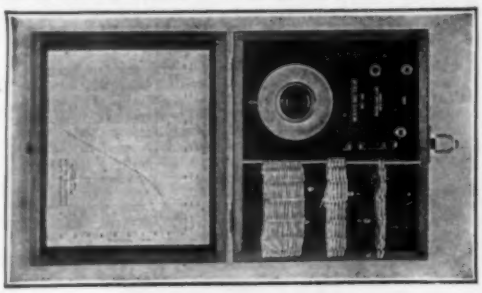
Ask your dealer or write us



TRANSMITTING INDUCTANCES
Flatwise Wound on Glass

Every Arctic or Tropical expedition now in action is equipped with the REL inductances. They are the inductances which every efficient short wave station will eventually use.

Type "L" — 40-80 and 150 meters
Type "S" — 20 meters and lower
Single units, with 3 clips Price $5.50
Double units, with 2 glass rods (as illustrated) Price $11.00



WAVEMETER
With Neon Tube Indicator

Wavelength range 17 to 550 meters.
Individually calibrated with 1% accuracy.
Plain and simple reading curve chart.

Type "A"— Price $22.00

We manufacture a complete line of short wave equipment such as plug-in coils, RF choke coils, transmitting kits, etc.
Special three and four coil Meissner inductances built for broadcasting stations. Write us your requirements.

Radio Engineering Laboratories

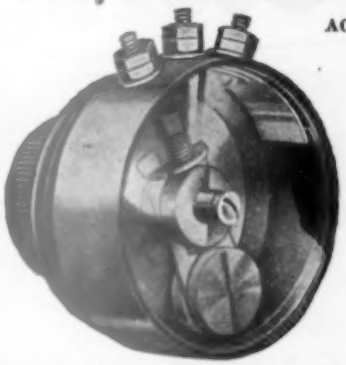
27 Thames Street New York, N. Y.

Two New

FROST-RADIO

UNITS *for* SET BUILDERS

ACTUAL SIZE



FROST-RADIO Type 890 Series

Super Variable Resistance

For fine control of volume, tone, regeneration, grid bias, etc. They are far superior to wire wound types and have many new exclusive advantages. The spring roller contact arm gives any degree of resistance smoothly and noiselessly without wear. After a 46,000 turn test in our laboratory this unit showed no noticeable variation in resistance. Element has large current carrying capacity and will not over-heat. Entirely enclosed in dust-proof nickel plated case. Arranged for single hole mounting and equipped with bakelite pointer knob. Type 880 (2 terminals) is supplied in 50,000, 100,000, 200,000 and 500,000 ohm sizes; Type 890 (3 terminals) in 400, 2000, 50,000, 100,000, 200,000 and 500,000 ohms. Both types, $1.25 each at your dealer's.

FROST-RADIO Type 700 Metal Frame Rheostats

A simple, rugged rheostat that gives smooth and accurate control of both output (volume) and filament voltage. It will take 25% to 50% overloads without over-heating. The contact arm glides over the windings without wear yet always with positive contact. FROST-RADIO Rheostats are supplied in resistances of 2½, 3, 3½, 4, 5, 6, 7, 10, 20, 30, 50 and 75 ohms. Equipped with pointer knob and arranged for single hole mounting. Price 50c,

Type 700

ACTUAL SIZE

FROST-RADIO MEMBER R.M.A.

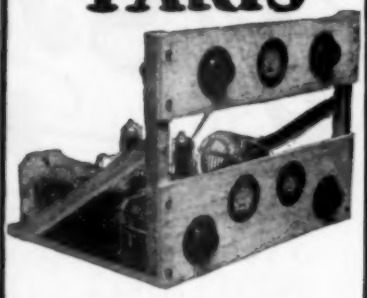
HERBERT H. FROST, Inc.

160 North La Salle St.

New York CHICAGO Los Angeles

TRANSMITTING

KITS-SETS -PARTS



Complete Transmitter Installations 5 to 1000 Watts

Full Line of Transmitting Parts at Reduced Prices

Jewell, Weston, Thordson, Acme, Hammarlund, Cardwell, Allen-Bradley, RCA, National, Ward-Leonard, REL, Faradon, General Radio, Aero, Pyrex, Tobe, Fleron, etc.

Unsurpassed DX with the ARSCO RS-100

10–110 Meters
1 Stage A. F.

A precision instrument designed and built for maximum efficiency on the short waves.

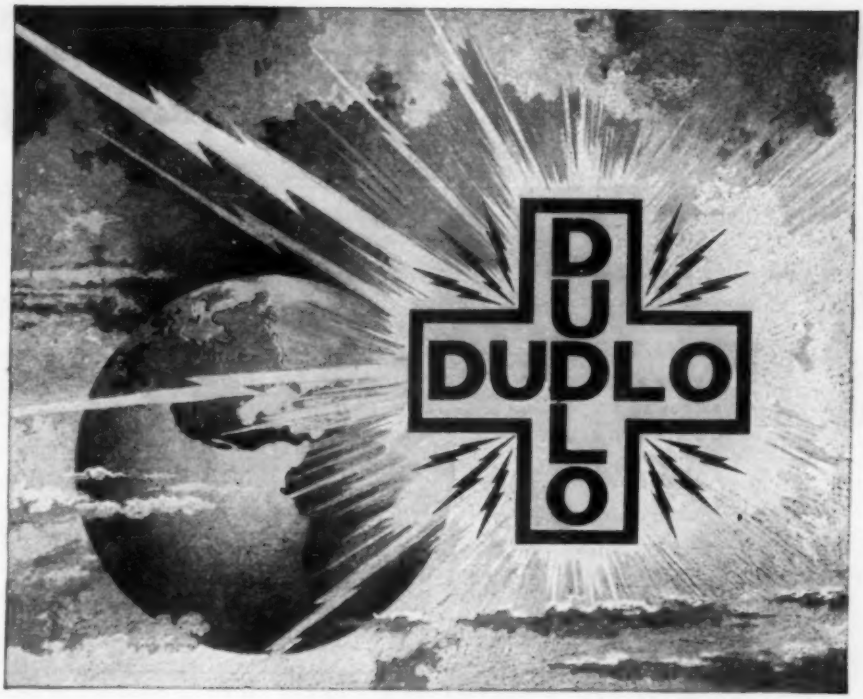
Price Including mahogany cabinet and full set of plug in coils . . $38.00

SEND for CATALOG

ARSCO

77 CORTLANDT ST. New York

AMATEUR RADIO SPECIALTY CO.



Throughout the world, wherever electricity is used, this distinctive mark stands for dependability in

Magnet Wire and Windings

This trade mark on a spool of wire, on a coil in a Radio unit or any electrical apparatus, is a guarantee to the purchaser or user that there is no better made.

Back of this mark is the world's largest manufacturer of magnet wire and windings with ample resources to support the guarantee of satisfaction which goes with every Dudlo product.

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SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST

NEVER BEFORE!

A Cargo of MAGNAVOX Radio

PROBABLY NEVER AGAIN

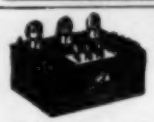
at Bargain Prices

MAGNAVOX POWER REPRODUCERS

Designed for those who desire the very utmost quality in the reproduction of programs or CW. By means of a VOLUME CONTROLE immense volume or soft tones can be had at will. Battery current consumed is negligible. Finished in crystallized enamel.

MAGNAVOX POWER REPRODUCER R3. List Price $35.00. OUR PRICE $11.75.

MAGNAVOX POWER REPRODUCER R2. List Price $50.00. OUR PRICE $16.75.



MAGNAVOX AUDIO FREQUENCY POWER AMPLIFIERS

Brings that station just beyond reach of your ears in as loud as you desire. Can be used with new type power tubes.

Model A1; 1-stage in heavy crystallized enameled metal. List Price $27.50. **OUR PRICE $8.75.**

Model AC2C; 2-stage in polished hardwood cabinet; list $55.00. **OUR PRICE $11.50.**

Model AC3C; 3-stage in polished hardwood cabinet; list $75. **OUR PRICE $16.50.**

MAGNAVOX COMBINATION SETS (Amplifying Reproducers)

Reproducer combined with R3 power amplifier compactly mounted in crystallized enamel case; will cover the widest range of operating conditions, whether a small room or large concert hall.

Model A1R; combination reproducer and 1-stage amplifier; list $59.00. **OUR PRICE $14.75.**

Model A2R; combination reproducer and 2-stage amplifier; list $85.00. **OUR PRICE $18.75.**

OTHER MAGNAVOX MATERIAL AT 60% OFF LIST PRICES

Model AC2D; special power amplifier; 2 stages extreme amplification; list $250.00.

Model AC3D; special power amplifier; 3 stages extreme amplification; list $350.00.

(The above outfits are used in loudspeaking telephones and in public address systems.)

Model AT2E; 2-stage Amplivox; power amplifier designed for either phonograph, radio or telephone amplification. List $100.00.

Model AT3E; as above, with 3 stages of amplification. List $115.00.

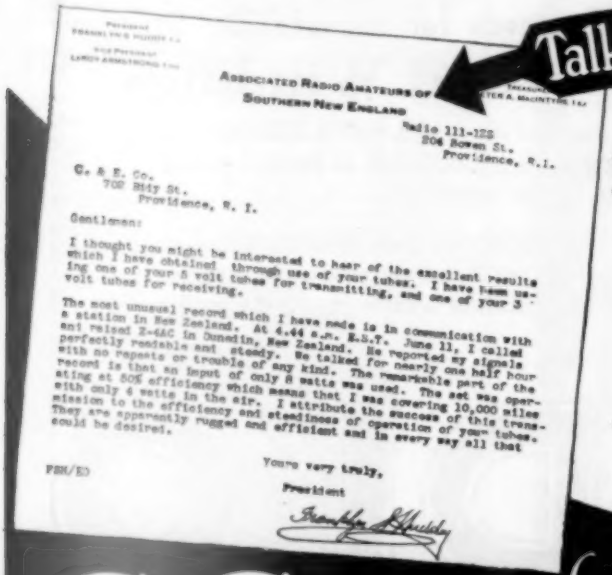
Model TP1A; not for radio use; designed purely for electrical amplification of phonograph music. List $125.00.

Model TR1R; Telephonograph combination designed for either radio or phonograph amplification. List $115.00.

	List Price	OUR PRICE
Signal Navy Receiving Transformers	$12.20	$2.75
Federal Phones	7.00	1.95
Signal Moulded Condenser, suitable for transmitting grid	.50	.20
C. R. L. Power Rheostat	1.50	$ .75
Mahogany Cabinet with panel	10.00	3.95
Signal KD Wavetrap	3.00	.95
Signal Loose Coupler	7.70	4.50

RADIO SURPLUS CORPORATION

250 Washington Street Boston, Mass.



ASSOCIATED RADIO AMATEURS OF SOUTHERN NEW ENGLAND

Radio 111-12S
204 Bowen St.
Providence, R.I.

C. E. Mfg. Co.
700 Bity St.
Providence, R. I.

Gentlemen:

I thought you might be interested to hear of the excellent results which I have obtained through use of your tubes. I have been using one of your 5 volt tubes for transmitting, and one of your 3 volt tubes for receiving.

The most unusual record which I have made is in communication with a station in New Zealand. At 4.44 a.m. E.S.T. June 11, I called and raised Z-4AC in Dunedin, New Zealand. He reported my signals perfectly readable and steady. We talked for nearly one half hour with no repeats or trouble of any kind. The remarkable part of the record is that an input of only 8 watts was used. The set was operating at 50% efficiency which means that I was covering 10,000 miles with only 4 watts in the air. I attribute the success of this transmission to the efficiency and steadiness of operation of your tubes. They are apparently rugged and efficient and in every way all that could be desired.

Yours very truly,

PBH/ED

President

Talks with New Zealand

READ THIS LETTER

Mr. Huddy uses EC TUBES

—a type for every radio need. Write for complete data sheet.

EC Tubes of Longer Life!

MADE BY THE C.E. Mfg. Co. INC Providence, R.I., U.S.A.

THE LARGEST PLANT IN THE WORLD DEVOTED EXCLUSIVELY TO THE MANUFACTURE OF RADIO TUBES

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST

FREE

This 84 Page Wonder Book of RADIO Bargains

Send for this guide to Radio price and Radio quality. All of our vast resources and radio experience have been utilized to assemble for you in one gigantic institution, the best and newest things in radio. The Randolph catalog is indeed the radio market place of the world—a masterpiece of merchandising that befits our house, **the largest exclusive radio mail order house in the world.**

What Our Catalog Contains

Over 2,000 items—from the most beautiful, fully equipped console model radio set, down to the smallest part or tool for the set builder—kits, parts and supplies of every conceivable type and style. All beautifully illustrated and interestingly described. And to give this book added value, we have included radio data that makes it an invaluable text book for every lover of today's most fascinating and most wonderful achievement—RADIO.

Radio Sets

In this great radio market place you will find table model sets and console types with built-in loud speakers; the newest ampliphonic console sets; new Spanish period consoles; **five, six, seven, and eight tube sets,** with three dial, two dial, and the **newest and most popular single simplified control.** All sets are assembled in beautiful, genuine mahogany and walnut cabinets in a choice of latest types and designs.

5 Tube sets as low as $24.90
Latest 1927 Models

All Randolph sets are sold at amazingly low prices. No matter what kind of set you want—no matter how little you want to pay—you can select YOUR SET AT YOUR PRICE from the Randolph catalog.

Radio Kits

Include the following well known circuits, designed and approved by the world's foremost radio engineers: **Madison Moore Super; Victoreen Super; Silver Marshal Six; Sargent's Infradyne; Remler Super; Short Wave Kits; 9-in-Line Super; New Acme Reflex; Cockaday; Neutrodyne; Browning-Drake;** all classes of radio **frequency, Super Heterodyne** and every other approved popular circuit.

Radio Parts and Supplies

The Randolph catalog also contains a most complete line of **"B" Battery Eliminators,** including the famous **Raytheon Eliminators;** the latest type Loud Speakers, Cone Speakers, a complete line of quality "A" power units —in fact, you will find listed in this wonder book every part that goes into the construction of a radio set, or any accessories you desire, at prices that mean a **substantial saving to you.**

Free Radio Service

Everyone has need for radio service. We employ Radio Engineers who have made Radio their life work. Their expert advice and helpful suggestions solve every radio problem of our customers.

Our Guarantee

Every article in our catalog is based on careful laboratory analyses and tests. We guarantee to back up every item in our catalog with our own as well as manufacturer's assurance of quality.

YOU MUST HAVE THIS BOOK

Space limitations here prevent our telling you more about the Randolph Catalog. Simply fill out and mail the coupon—or you may send a postal or letter—and this truly remarkable Radio book will come to you **ABSOLUTELY FREE.**

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Because we handle radio exclusively and sell a tremendous volume of everything in Radio, we can concentrate our buying power for the benefit of your customers.

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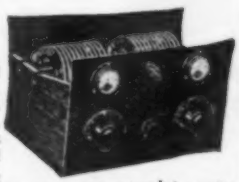
ALREADY

The Standard of the Critical Amateur

TECO SHORT WAVE RECEIVER

A receiver designed by amateurs and constructed of the highest quality products such as Cardwell Condensers, RCA Audio Transformer Vernier Dials and the famous TECO plug-in coils. Extreme care in construction and the quality of the parts insure efficient operation of the receiver of the entire tuning range of 10 to 200 meters (1500 to 30,000 kilocycles) Specially priced at $27.50.

TECO SHORT WAVE TRANSMITTER

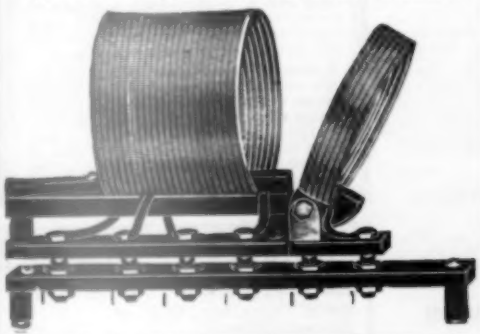


Built to TECO standard with the best of parts. Has all the necessary high voltage filters and chokes. A milliammeter and a hot wire meter are mounted on the front of the panel. Two sockets in parallel give operator complete control of the output. Tuning condensers are high voltage Cardwells. Specially priced at $39.50.

TECO CRYSTAL-CONTROLLED TRANSMITTER

A precision transmitter, the last word in the amateur world. Comes complete with Piezo quartz crystal callabrated to your specifications. A pilot lamp on the front of the panel tells you when you are right on the mark. There is also a radiation meter on the panel. This transmitter is a counter part of the one used by the Byrd Expedition. Specially priced at $87.50.

TECO FAMOUS PLUG-IN COILS

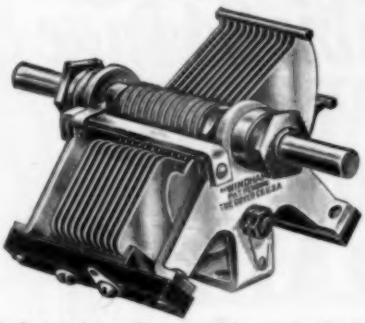


These coils are spaced wound using 16 gauge wire on a "Protectoid" form, a non-inflammable, non-conductive, composition mounted on grained bakelite using TECO plugs. These coils can be used in any short wave receiver and are designed for use with short wave condensers having capacity of 150 m. mfd. and 250 m. mfd. for antenna and oscillation tuning respectively. For a complete set of five coils with mounting strip and antenna coil. $12.00.
Separate coils for 10, 20, 40, 80 or 200 meters $2.50

TRANSMITTING EQUIPMENT CO.
19 Stewart St., Boston, Mass.

AGAIN WE ANTICIPATE YOUR WANTS

The New "WINDHAM" Universal Condenser



Independent Removable ¼" shaft of desired length passes through a Hollow Spindle permitting clock or counter clock-wise rotation with all the other Windham features so well known to the trade. Single or double spaced 3 to 23 plates panel or test board mounting.

Send for Catalog

THE GOYER COMPANY, Willimantic, Ct.

The Greatest Quality Buy Today

The Hawley rechargeable "B" storage battery completely assembled and ready to run including electrolyte, 22½ volt, $2.95; 45 volts, $5.25; 67½ volts $7.65; 90 volts $10.00; 112½ volts $12.50; 135 volts $14.75; 157½ volts $16.80; 180 volts $19.20; 202½ volts $21.60.

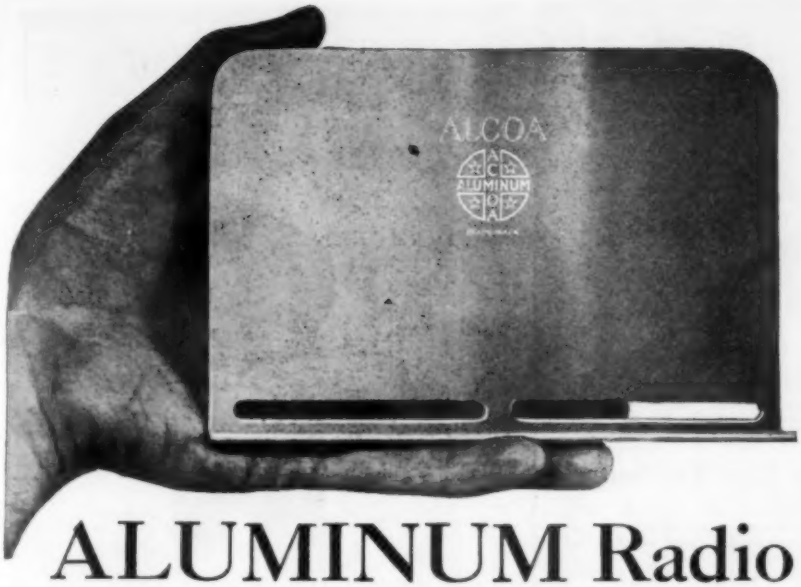
Knock-down kits at still greater savings. All assembled batteries and kits contain the now recognized famous "Sur-Loc" connectors. Does not close up 15 to 30% of the elements as crimped on connectors do. With its patent pending grip it cannot come loose from the expansion and contraction of the positive element which others are subject to. All told this means — quiet, clearer reception—greater length of life per charge and economy in charging. Don't be satisfied with antiquated construction.

Complete ready to run "B" storage battery charger, $2.75. This may be connected directly to battery. Also may be used as a trickle "A" battery charger. Complete sample cell 30c prepaid.

All goods sold on understanding that they give satisfaction, and can be returned in 30 days for complete refund. Further guaranteed two years. Order direct—send no money—simply pay expressman cost on delivery. Or write for my free literature—it's free— it will tell you what to expect and contains some mighty interesting matter.

B. HAWLEY SMITH

31 Washington Ave. Danbury, Conn,



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Only the genuine bears this mark

ALUMINUM Radio Shields

The latest sensation in radio and used by Cockaday in his new LC-27.

See our demonstration of the shields at work at the New York and Chicago Shows.

Use the Coupon to Get Your Copy of

"ALUMINUM RADIO SHIELDS"

A complete treatise of unusual interest on the vital importance of proper shielding by Cockaday, Free, and the Research Engineers of the Aluminum Company of America.

Their unique "shielding" value is largely due to the conductivity of the virgin aluminum used (highest mass conductivity known), their accurate and predetermined thickness, and their scientific design and precision manufacture.

Developed by L. M. Cockaday and the Aluminum Company of America to eliminate distortion due to feed-back, interference between units, and loss of energy due to absorption. Fully effective. Universally adaptable.

Put them in your new set—your ingenuity will find effective applications—note the surprising results—look for them in the latest standard manufacturers' models.

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PITTSBURGH, PA.

Aluminum Company of America,
Room 2322, Oliver Building,
Pittsburgh, Pa.

Gentlemen:

Please send me a complimentary copy of the booklet "Aluminum Radio Shields."

Name.....

Street.....

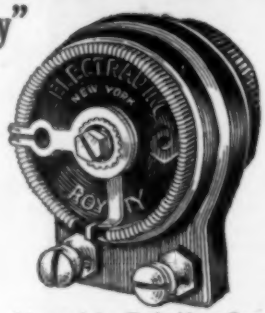
City.....

What Circuit do you now use?.....

What one will you build next?.....

ELECTRAD

Say "Royalty" and Be Sure!



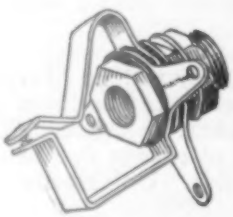
New MODEL

ELECTRAD

Licensed by Technidyne Corporation under U. S. Patent 1593685, July 27, 1926.

Royalty Variable High Resistances

Recommended and indorsed by leading radio authorities. Note these superior features:
Resistance element not cemented to any mechanical operation.
Metallic arm on wire-wound strip insures positive electrical contact.
Same resistance always obtained at same point.
Resistance value under control in process of manufacture—remains constant in use.
Shaft is turned smoothly over entire range of resistance with less than a single turn of the knob.
Eleven types—a range for every purpose. Type E—$2.00; all other types, $1.50.



Electrad Certified Jacks

Note these important advantages:

Positive acting spring of phosphor bronze. Sterling silver contact points. Insulation of hard rubber. Tinned soldering lugs, so placed that good connections can easily be made. Require less than 1" behind panel. Certified and guaranteed electrically and mechanically. Open, 25c; closed, 35c; in Canada, open, 35c; closed, 50c.

For perfect control of tone and volume use the Electrad 500,000-ohm compensator. For free hookup write 428 Broadway, New York City.

ELECTRAD

SANGAMO

Mica Condensers

in the

Stromberg-Carlson RECEIVER

RADIO enthusiasts sat up and listened when the opportunity came to hear the Stromberg-Carlson receiver. That firm's name means *quality*. Their set won a leading place immediately in a market that seemed overcrowded with good makes. No claims are made of revolutionary ideas in new circuits, but every part is made with scientific precision.

Sangamo Mica Condensers are used in the Stromberg-Carlson because they are permanently accurate. Sangamo condensers are solidly molded in bakelite. All edges are sealed tight; no moisture can creep in to change the capacity. Their accuracy is guaranteed to be within 10 per cent and to remain unchanged. Distinctive in appearance, too; completely enclosed in velvet-smooth brown bakelite; all corners rounded to prevent chipping; reinforcing ribs for mechanical strength.

Experiment with "world-beater" circuits if you will—but remember that accurate Sangamo Mica Condensers will improve the tone and range of any set. You can fit your set exactly—there are 35 capacities to choose from.

Tried SANGAMO BY-PASS CONDENSERS? *They stand the surges without breaking down.*

SANGAMO *Accurate* Radio Parts

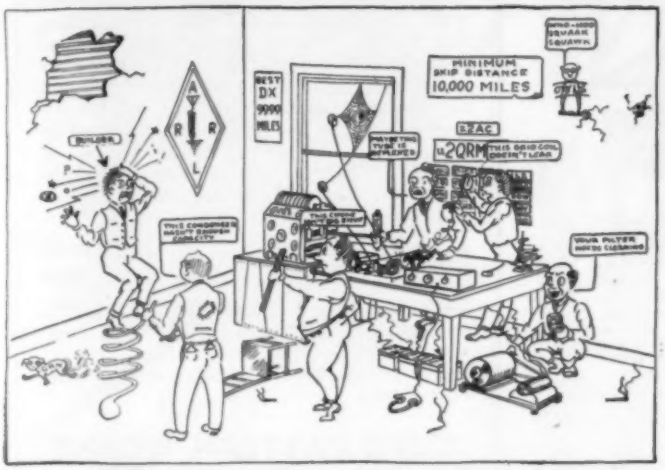
Sangamo Electric Company

6332-8 *Springfield, Illinois*

RADIO DIVISION, *50 Church Street, New York*

SALES OFFICES—PRINCIPAL CITIES

Cardwell



TROUBLE!

is what you *WONT* have, if you use Cardwells. No QSZ or QTAs—always QSA.

The 191E—.000075, or the 167E—.00015, illustrated below, is F. B. for that Aero-Coil set, or any short wave tuner.

SEND your order today, and ask how we built our short wave tuner.

NOTE

For John Claytons "Universal" Plug-in Receiver—The Type 200-B lists at 8 Bucks.

The type C gives a modified straight wavelength.

Type "C"	Type "E"	Capacity Mmfds	Price
167-C	191-E	75	$3.75
168-C	167-E	150	4.00
170-C	168-E	250	4.25
171-C	169-E	350	4.75
172-C	192-E	500	5.00

Transmitting

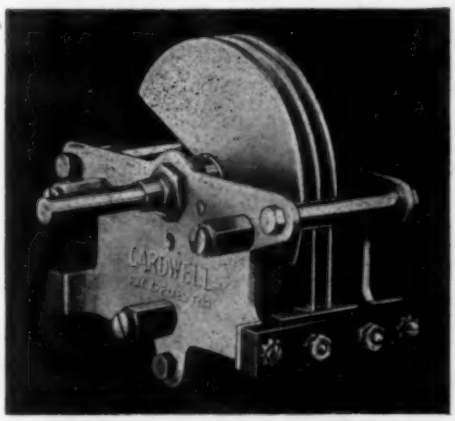
VARIABLE

Capacity Mmfds	Type No.	Breakdown Voltage	Price
250	164-B	3000	$ 7.00
440	147-B	3000	10.00
80*	197-B	3000	8.50
217*	157-B	3000	12.00
156	183-B	5250	15.00
297	166-B	7600	70.00
480	123-B	1400	5.00
480*	156-B	1400	7.00
980	137-B	1400	7.00

FIXED

250	501	3000	$ 4.50
440	502	3000	7.00
966	503	3000	10.00
250	504	5250	15.00

*Has two insulated stators-capacity of each.



The Allen D. Cardwell Manufacturing Corporation

81 PROSPECT STREET — BROOKLYN, N. Y.

Condensers

"THE STANDARD OF COMPARISON"

None other than high quality radio products can give good steady results—

All Benjamin Radio Products are of the same high standard as the far-famed Cle-Ra-Tone Sockets—

IMPROVED TUNED RADIO FREQUENCY TRANSFORMERS

Proved through exhaustive comparative tests to be the most efficient coil for modern radio sets.

2¼" DIAMETER TRANSFORMER

Compact. Especially desirable for crowded assembly. Eliminates interfering "pickup."

Set of three, $5.75. Single Transformer, $2.10

3" DIAMETER TRANSFORMER

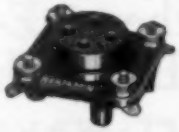
Capacity coupling reduced to lowest degree. For use with .00035 Mfd. Condensers.

Set of three, $6.00. Single Transformer, $2.25

STRAIGHT LINE FREQUENCY CONDENSERS

No crowding of stations. Adjustable turning tension. Low loss characteristics give a definite and distinct radio reception. Beautiful in appearance. Finished in dull silver. Made in three sizes:

.00025 Mfd., $5.00
.00035 Mfd., 5.25
.0005 Mfd., 5.50



"LEKELESS" TRANSFORMERS

Uniform high inductance, low resistance. The external field is so slight that it permits placing coils together without appreciable interaction. *Single transformer, $2.50.*

PUSH TYPE CLE-RA-TONE SOCKETS

Spring supported. Shock Absorbing. Stop Tube Noises. Greatest aid to non-noisy operation. Contacts always clean.

75 cents each

BATTERY SWITCH

Quick, positive, clean-cut make and break. When it's "in" it's "off," eliminating danger of wasteful use of battery. *30c each.*

BRACKETS

Supports sub-panel, with room underneath for accessories and wiring. Plain and adjustable. *Plain 70 cents per pair; adjustable $1.25 per pair.*

PRIZES FOR RADIO HOOKUPS

A contest for new and original circuits. Write our nearest office for full details.

Benjamin Electric Mfg. Co.

120-128 S. Sangamon St.

New York: 247 W. 17th St. — Chicago — San Francisco: 448 Bryant St.

Manufactured in Canada by the Benjamin Electric Mfg. Co., of Canada, Ltd., Toronto, Ontario

If your dealer cannot furnish you with Benjamin Radio Products send amount direct to our nearest sales office with his name and we will see that you are promptly supplied.

ELITE DRILLED 4-IN-1 TUNER PARTS

12 jack stands, with dowel rod "legs" ¾" high, drilled for General Radio jacks or undrilled; 3 grid coil plug-in holders with 2½" high dowel supports, drilled for G. R. plug-in spring tips, or undrilled; 3 plate coil holders, drilled or undrilled; antenna and tickler hinged coil holders, drilled for plug-in tips, or undrilled. All plug-in strips, drilled or undrilled. All hard wood boiled in paraffin. 34 pieces in all. Gives chance for wide range of quick change experimentation.

Assembled and Drilled set $7.00
Assembled, but undrilled set 6.00

50% discount to transmitting A.R.R.L. members, if station call letters accompany order.
Send postal money order, or personal check to

ELITE PATTERN WORKS

996 Maple St. Detroit, Mich.

COMPLETE WITH TUBE $25.00

George Electric Company "B POWER UNIT"

Delivers the proper voltage at all times without a trace of a hum. Sturdily constructed to last as long as the best radio set.

A full wave rectifier tube is used, no filament to burn out. Variable resistance control detector and amplifier voltages. 180 volt tap for power tubes. Plenty of current for any set on the market.

Lower Price Higher Quality
Positive Guarantee

Sold direct from the factory to you, or thru our authorized representatives. Write for complete information. Shipped prepaid on receipt of $25.00, or C.O.D. for $25.00 plus postage.

GEORGE ELECTRIC COMPANY,
756 Carleton Ave., St. Paul, Minn.

Agents and dealers wanted!!!
Write for attractive agency proposition

Type R-14—3 to 1 . . . . . } $4.50
Type R-15—5 to 1 . . . . . } ea.

New!

ALL-AMERICAN
TRADE MARK
AUDIO TRANSFORMER

This latest development meets the new demands for compact wiring and longer life—

Binding Posts are conveniently located for straight or sub-panel wiring—

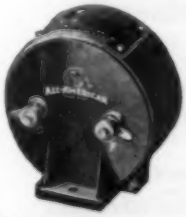
The coil is vacuum impregnated—

After assembly the shell is filled with special compound and the complete unit hermetically sealed. *A transformer that sets a new standard.*

Tone Quality Is the Keynote

No standards of quality can be higher than those we set for our own products; no inspection is more rigid; no tests more severe of radio reception. Each is designed and made with the same care that goes into the finest receiving sets.

Each of these All-American Transformers plays its part in determining the quality These products have helped to create All-American leadership.



UNIVERSAL COUPLER highly efficient both as antenna coupler and tuned R.F. Transformer

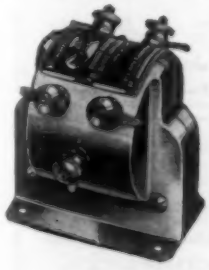
New 1927 Radio Key Book

Everybody who enjoys radio should read it—an interesting 48-page analysis of radio in terms anybody can understand; with complete constructional details of the leading types of circuits. Send 10c in coin or stamps for your copy.

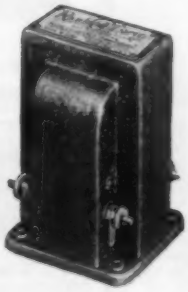
SELF TUNED R. F. TRANSFORMER effectively amplifies all frequencies. Designed to match tube characteristics

All-American Radio Corporation
4223 Belmont Avenue · CHICAGO

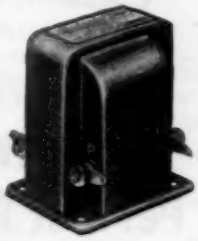
RAULAND-TRIO
An inductance, a resistance and a capacity perfectly balanced in one shell—a compact factory-built unit for impedance coupled amplification



POWER (PUSH-PULL) AMPLIFYING TRANSFORMER, gives power amplification without distortion where excessive volume is demanded



RAULAND-LYRIC
An audio Transformer, famous for its perfect tone reproduction—an outstanding product. Made with painstaking thoroughness without regard to cost.



Are You Building A B-Eliminator?

IF SO, follow the example of leading radio engineers and use the Bradleyohm-E and Bradleyunit-A for your voltage control.

Bradleyohm-E is a new and enlarged Bradleyohm designed expressly for B-Eliminator service. The extra long columns of scientifically-treated graphite discs insure perfect voltage control, even after long usage.

Bradleyunit-A is a solid molded resistor that is heat-treated and accurately calibrated. It can be soldered without affecting its calibration. Ask your dealer for Bradleyohm-E and Bradleyunit-A for your B-Eliminator.

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277 Greenfield Ave. Milwaukee, Wis.

Use Allen-Bradley Perfect Radio Devices

THE TUBE WITH THE SENSIBLE GUARANTEE

Visible Truth!

All Types at Public Demand Prices

SX 201 A	$2.00
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SV 199 small	2.25
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SX 120	2.50
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All tubes look alike more or less—they are easily disqualified in handling.
You are told **"this"** is better or **"that"** is better—Perhaps it is true—Perhaps not.

Supertrons are Different
You see a re-enforced interior construction.
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A SERIAL NUMBER GUARANTEE
The Foremost Independent Tube in America

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You have always used .002 mfd. for blocking condensers but who knows that it *is* the best size for short waves? The builders of KFUH believe .000036 mfd. better for their tuned grid 'n plate circuit. Our UC 1015 condenser gives eleven different capacities between .0002 mfd. and .001 mfd. so you can select the best size for your set. Why not try them?

Price $1.25 postpaid

General Electric Gridleaks

Brand new enameled porcelain G. E. Gridleaks in 5000 ohm and 10,000 ohm sizes for all tubes. Size 1" x 6".
PRICES, 5000 ohm $1.25, 10,000 ohm $1.75, Postpaid.

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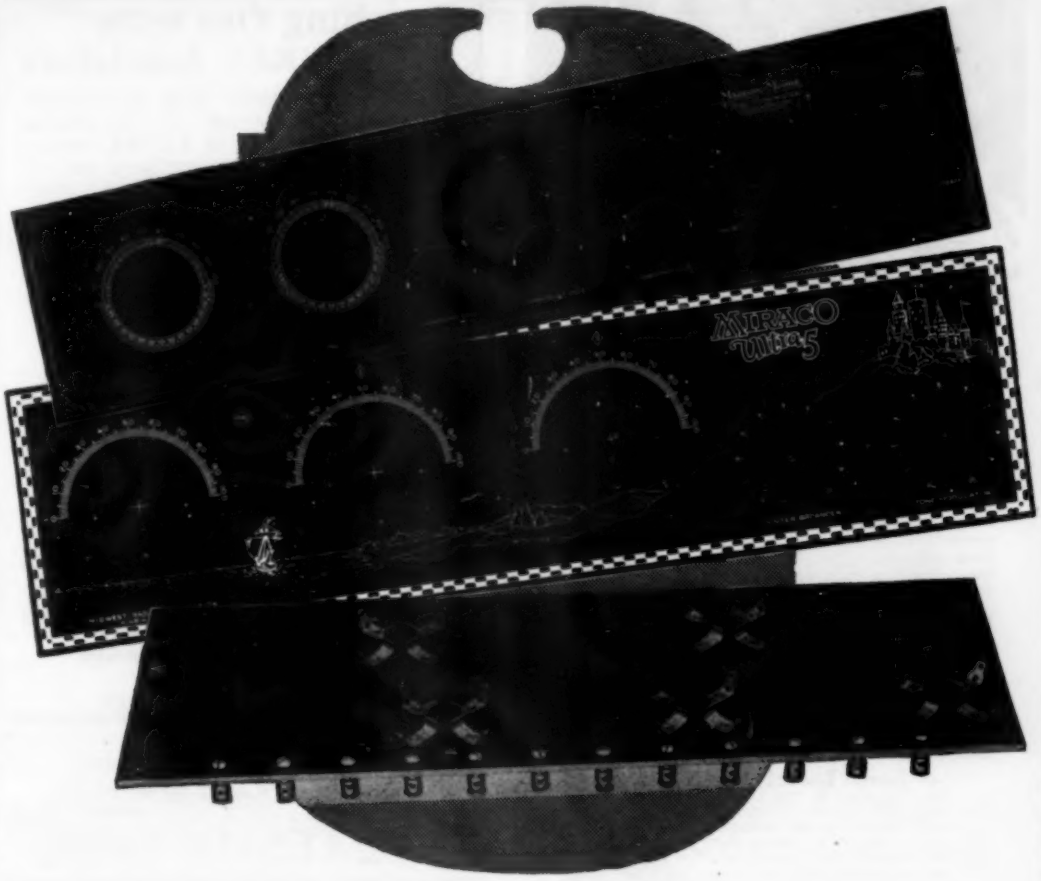
Our "UNIVERSAL" "B" Device will satisfy your requirements for superior reception. Thousands in Service. Two year guarantee. Price $22.50. Here's a business builder.

Our proposition will please you. Write!

KIMLEY ELECTRIC COMPANY
2664 Main St., Buffalo, New York



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Formica panels for well known kits Veri Chromed in gold on high gloss Formica are sold by leading dealers and jobbers: Bremer Tully Counterphase; Browning Drake National; General Radio Four Tube Universal; LC 26 Cockaday; Victoreen Superheterodyne; Best's Superheterodyne; Madison Moore Superheterodyne; Camfield Duoformer; Aerodyne 5 Tube; St. James 8 Tube; Karas Equamatic, front and sub-panel; Infradyne, 7x30 and 7x28.

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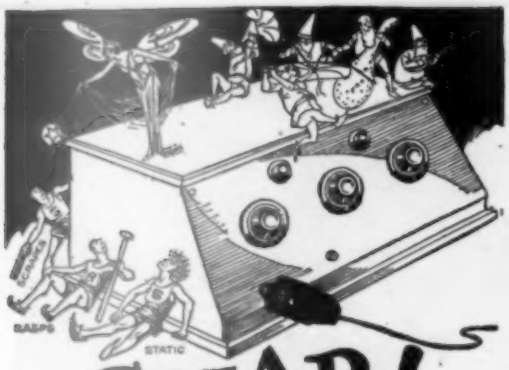
Made from Anhydrous Bakelite Resins

SHEETS TUBES RODS

Formica has a Complete Service on Insulating Material and Parts for Radio Manufacturers



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Poly Claro-Plug Improves Your Loud Speaker's Tone Almost Beyond Belief

Chases the scrapes, rasps and other extraneous noises from your loud speaker; modifies static; broadens the range, booming in the bass and high tones; improves the tone quality of even the *most inexpensive* loud speaker.

Merely plug into the loud speaker jack and push phone plug into sleeve provided. For sets without jacks, attach to binding posts—simple, easy, quick. Try one on your set today. Sold with money-back guarantee.

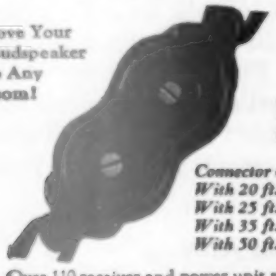
Price $1.50

Polyplugs Can't Be Tugged or Jarred Loose!

The loud speaker cord criss-crosses through Polymet's exclusive tension slot. Now just try to loosen that positive contact by tugging or jarring—not a chance in the world! Automatic, quick, easy. Demonstrating the fact that it pays to buy the best!

Poly Plug, Genuine Bakelite **50c**
E-Z Plug, Composition . . **35c**

Move Your Loudspeaker To Any Room!



E-Z Extension Connector

Connector only	**35c**
With 20 ft. Cord	**$1.25**
With 25 ft. Cord	**1.50**
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With 50 ft. Cord	**2.00**

Over 110 receiver and power unit manufacturers specify Polymet Products as standard equipment. THEY KNOW! At good dealers everywhere.

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Reaching Out with PYREX Insulators

PYREX* Insulators help your transmitting set reach out to greater distances. The use of PYREX Insulators in short wave transmitters and receivers eliminates leakage and eddy losses. The country's greatest power stations, The Byrd Polar Expedition, the Navy, the Coast Guard and Air Mail Service, all have depended on PYREX Insulators for greatest efficiency.

Select your equipment from the following list of PYREX Insulators

PYREX—Low Power Transmitting Antenna Insulator, 7¼" long	1.50
PYREX—Medium Power Transmitting Antenna Insulator, 12¼" long	3.50
PYREX—High Power Broadcasting Station Antenna Insulator, 30" long	22.50
PYREX—Stand-off Insulator, Height 3" overall	2.75
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PYREX—Lead-in Insulator, Navy Standard Bowl Type, for voltages up to 10,000 1.50. Complete with metal fittings	15.00

CORNING GLASS WORKS
Industrial and Equipment Division
Corning, N. Y.

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ACME CELATSITE WIRE

—a tinned, copper bus bar wire with non-inflammable "spaghetti" covering, for hook-ups. 5 colors; 30-inch lengths.

Flexible Celatsite

Flexible, stranded wire for point-to-point and sub-panel wiring. Non-inflammable "spaghetti" covering. In black, yellow, green, red and brown; a color for each circuit. Put up in 25-ft. coils.

Send for Complete Acme Wire Products Folder

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ACME WIRE
MAKES BETTER RADIO

"CAGE ANTENNA SPREADER"
DIAMETER 7 IN.
Patented Sept. 8th, 1925

When erecting your Herts antenna, why not feed into a 4, 6 or 8 wire cage antenna-counterpoise? By using these Spreaders, the job can be done very quickly and efficiently. Circular upon request. Price: $5.00 per dozen; $2.75 for a half dozen. Immediate delivery. I pay the postage.

CHARLES F. JACOBS (RADIO 2EM)
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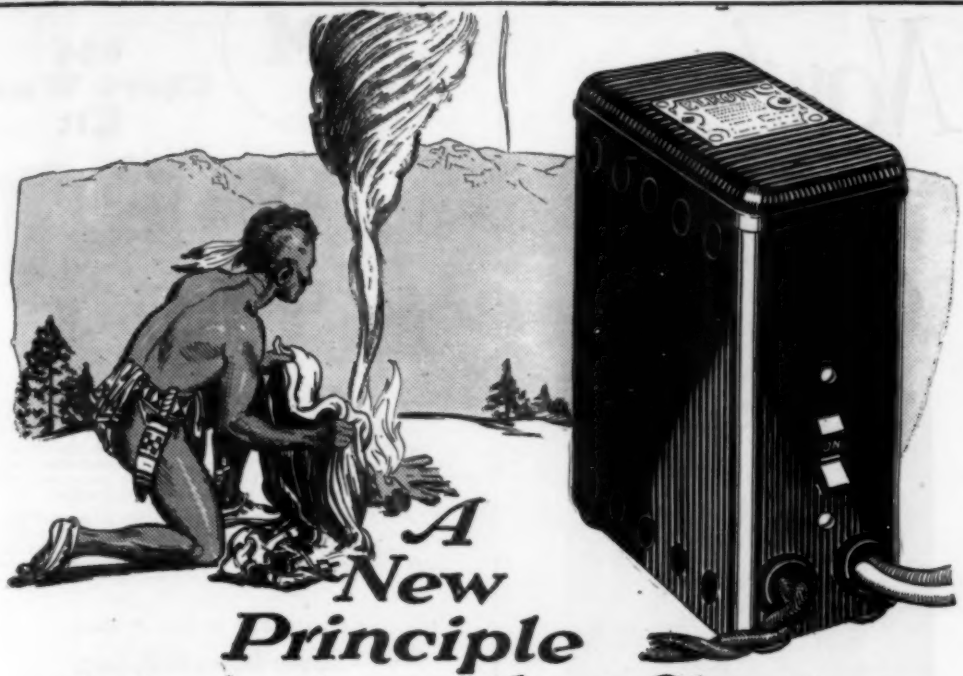

A New Principle not—just another Charger

THE ELKON TRICKLE CHARGER is as different from earlier attempts at "A" battery charging as Radio Signalling is from the signal fires of the Indians. All the former expedients necessary to secure current rectification are done away with. Two small discs, of dissimilar substances, in pairs, replace all the water, the acids, the alkalis, tubes and oscillating devices hitherto resorted to. And they not only rectify in a positive manner, but do so without interference, without noise, without heat, *and without attention.*

The Elkon Trickle Charger will operate in *any Position.* Short circuiting cannot harm it. It cannot overcharge for it tapers automatically from 0.7 amps to practically zero. It is full wave.

Install it .... set it .... forget it .... Your "A" battery charging becomes a perfunctory matter, entirely automatic and dependable, and your time is freed for more important work. You need one.

Operates from 105-120 v., 50-60 cycles, direct from A. C.

$15.00 *complete with switch*

25-40 cycles also available at a slightly higher price

ELKON WORKS Inc.

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Sole licensees under patents pending to Samuel Ruben

ELKON TRICKLE CHARGER

Now!

Kingston

B BATTERY ELIMINATOR

Do away with troublesome, expensive, bulky batteries, with acid, stained carpets, a dead radio just when you want it most. Install the KINGSTON B battery Eliminator and forget your battery troubles forever. Trim, handsomely finished in black and nickel, and guaranteed not only to remove the battery nuisance, but to deliver clearer tone and increased volume. Three different voltages obtainable at same time, each tap adjustable over a wide range, making any desired voltage from 5 to 150 possible and harmonizing perfectly with your own set. The Raytheon tube is used as a rectifier.

At Your Dealer's

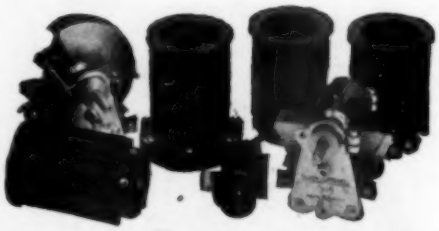
Price, complete with Raytheon tube **$35.00**

KOKOMO ELECTRIC COMPANY
KOKOMO, INDIANA

Kingston

SM

635 Short Wave Kit



The type 635 Short Wave Receiver Kit contains the carefully designed and matched essentials for a real short wave set. Its range is 18 to 150 meters. The kit contains a set of four plug-in-coils, one coil socket, one coupling condenser and two 140 mmf. condensers. These parts are all carefully designed for operation together.

With the four coils supplied, the amateur bands fall well to the center of the tuning scale. "Dead spots" at which the receiver will not oscillate are totally eliminated. The antenna condenser allows coupling adjustment to suit individual conditions.

Price $23.00 at Your Dealers

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ATTENTION OWNERS OF AMATEUR STATIONS

Now is the time to change your transmitter over to crystal control. For 40 or 80 meter work, we recommend either an 40 or 80 meter crystal. No need of using higher wave-length crystals to work on the low wave bands. Prices for grinding crystals in the various amateur bands as follows:—

150-200 meter band	**$20.00.**
75- 85 meter band	**$30.00.**
37- 42 meter band	**$50.00.**

The above prices are for grinding a crystal so as to oscillate somewhere in its respective band. Frequency stated accurate to better than one-tenth of 1%.

ATTENTION OWNERS OF BROADCAST STATIONS

We will grind a crystal for you, ground to your assigned frequency accurate to BETTER than a tenth of 1% for $50.00. This crystal is so ground so as to be capable for use in POWER circuits. Prompt deliveries.

Crystals ground to any frequency between 50 and 10,000 Kilo-cycles. Let us quote on your requirements.

THE CRYSTAL SPECIALISTS
Scientific Radio Service
Box 86 Dept. E Mount Rainier, Maryland

RADIO OPERATORS WANTED

THE EASTERN RADIO INSTITUTE can train you quickly and thoroughly because:

MODERN AND EFFICIENT METHODS
THOROUGH INSTRUCTION under staff of LICENSED COMMERCIAL OPERATORS
MODERN APPARATUS including SHORT WAVE TRANSMITTER
FOURTEEN years a RADIO SCHOOL
THE OLDEST, LARGEST and MOST SUCCESSFUL school in New England. RECOMMENDED BY THE A. R. R. L.
Day or Evening Classes Start Every Monday.
SPECIAL CODE CLASSES

Write for Illustrated Prospectus

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WHEN Glenn H. Browning and Francis H. Drake designed a radio frequency transformer which for the first time gave satisfactory amplification at the broadcast frequencies, they earned the world-wide good will of the amateur fraternity.

Recognized as the radio leader of his community, the amateur's recommendation carries tremendous weight in the selection of his neighbor's receiver.

This recommendation is the radio dealer's leading asset in promoting the sale of Browning-Drake Receivers.

Browning-Drake produces only one model, built complete at its Brighton laboratories. Fairly priced, and handled only by the highest grade jobbers, the Browning-Drake Receiver has never been cut, and no dealer has ever lost money on Browning-Drake.

Inquiries from amateurs, whether personally interested in broadcast reception or not, are always welcome and receive prompt attention.

The Browning-Drake Five
List price $95

Jobbers and dealers with an eye for the radio future should get our proposition. Write the Browning-Drake Corporation, Brighton, Mass.

BROWNING-DRAKE

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CELLCHEK

An electrical means of determining the condition of your storage-battery cells. Made with a resistance for placing a substantial load in excess of that ordinarily called for by Radio tube filaments, on each 2-volt cell. The meter although calibrated in volts is provided with a simple scale readable at a glance showing when the battery is in fully charged or poor condition or needs immediate recharging.

Overcomes need of withdrawing electrolyte for testing with attendant danger of damage to rugs, floors and furniture.

Tests automotive batteries too.

THE HOYT CELLCHEK, Price $2.50

Send for new catalogue "HOYT METERS for RADIO", describing many new additions to the HOYT Radio line, including the new HOYT Type 17 Meters with front zero adjuster and the HOYT Direct-Reading Tube Tester, which gives characteristics of all types of Radio tubes without calculation.

BURTON-ROGERS CO.

BOSTON, MASS.

National Distributors

IMPROVE!

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The REDI-MAST FOR AERIALS

A strong hand-turned rock-maple pole which gives a quick, convenient method of erecting a dependable antenna. 5 or 8 foot lengths, will fit any roof—single or multiple wire antennas. Will carry the heaviest sleet covered antenna in strong wind without weakening. Neat in appearance. Can be set up or dismantled without danger of causing leaks in roof. Complete set includes three steel guy rods ¼ inch in diameter, adjustable pulley, neb irons, roof sockets, anchor pins and full instructions, price 5 foot mast, each $3.50, 8 foot mast, each $4.25. Ask your dealer.

The WAVE-X Condensing Antenna is an aerial that can be quickly erected on wall, chimney or roof, anywhere 5 foot square is available. Several on one roof without interference. Provides sharper tuning, increases selectivity and is non-directional. Twelve durable highly conductive, non-corrosive, cast aluminum feelers reach out in all directions. Perfectly insulated to prevent losses. Only one upright to erect, only a hammer and a screw-driver needed. No. 2, with 8 foot pole ready to install with all accessories and full instructions $12.50. No. 3 for side wall or chimney mounting $12.50.

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Push-Pull Transformers for 7½ w. 50 3. and 250 w. speech input circuits.

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Variable and Fixed Air Condensers of any size required.

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Broadcast Station erecting, rebuilding and general engineering.

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Follow the lead of the leaders—

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SUPER AMPLIFYING TRANSFORMERS

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WORLD'S OLDEST AND LARGEST EXCLUSIVE TRANSFORMER MAKERS

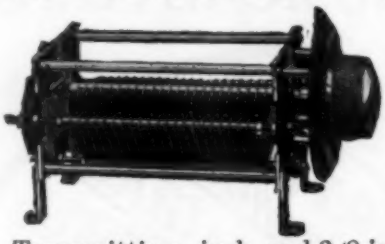
Huron and Kingsbury Streets — Chicago, Ill. U.S.A.

NATIONAL

TRANSMITTING VARIABLE CONDENSERS

.0001 Mfd., 23 plate, ⅝ inch spacing $12.50
.00015, 17 plate 3/16 inch spacing $7.50

Prices include Type A Velvet-Vernier Dials.



.00023, 23 plate, 3/16 inch spacing $11.50
.00045, 43 plate, 3/16 inch spacing $16.50

The NATIONAL Transmitting Variable Condensers have seen constant and satisfactory service in the hands of ARRL members for many years. They are used and approved by Lieut. Fred. H. Schnell, Don C. Wallace, A. A. Hebert, Gerald M. Best, L. W. Hatry, Lieut. Lowell Cooper. The plates are spaced 3/16 inch, and 3/8 inch apart for high voltage work. Because of the limited demand for these condensers, your dealer may not have them in stock. We are glad to accept orders for direct shipment when accompanied by remittance in full, including cost of transportation. Be sure you get genuine NATIONAL products.

Send For Bulletin 110-Q

NATIONAL COMPANY INC.

Engineers and Manufacturers — W. A. Roudy, President — Cambridge, Mass.

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The ham who hasn't a CRICKET Key is still riding in a buggy.
NO BUM FISTS. NO GLASS ARMS.
"Sounds like an omnigraph"—what more can you ask?
All the speed anyone can read;
What more do you need?
Prices.

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Brass contact, $9.00 prepaid	Brass contact, $10.25 prepaid.
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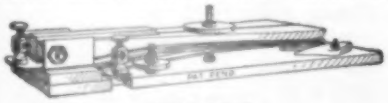

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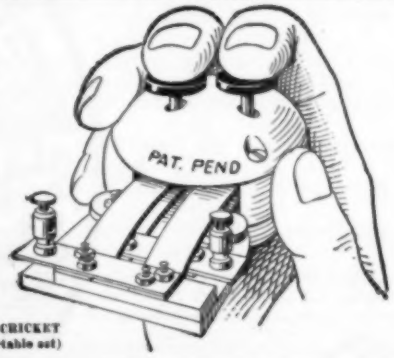
(Recommended especially for beginners)

F. F. Mace & Son, 132 Sunset Ave., Dallas, Texas



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(For that portable set)

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Designed for Reliable Long Distance Communication

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INPUT RATING 150 WATTS

Plate Voltages	500-3000
Plate Currents	40-50 MA.
Fil. Voltage	10
Fil. Current	2.35A

Sold and Shipped Direct Upon Receipt of Money Order

Price, $18.00
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TYPE-H

TRANSMITTING TUBE

THERMIONIC HR RECTIFIERS

Fil. Voltage	10	Plate Mill. Amps	250 Max 400**
Fil. Amperes	2.35	Voltage Drop	at 250 MA
Plate Voltage A.C.	2000	PRICE	$16.00

**Will operate 4 H Tubes

139 Franklin St., DE FOREST RADIO CO., Jersey City, N. J.

Pacent Universal Cushion Socket No. 83

A Real Cushion Socket

HERE is a new Pacent engineering achievement—a genuine Bakelite socket, with real spring suspension.

The special phosphor bronze solder tab and spring members are all in one piece. This unique spring design insures positive non-microphonic cushion effect.

Unique push-contact seats the tube-prongs properly and effects reliable, positive, contact.

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There are Over 200 Standard Types Of

Faradon

CONDENSERS on which Immediate Deliveries can be made

Devoting its resources since 1907 to specialized research and development in the Radio field and to the improvement, production and application of electrostatic condensers, the Wireless Specialty Apparatus Company continues to supply equipment to efficiently take care of operating requirements.

Not until a product has successfully passed exacting final electrical and mechanical tests is it considered worthy of the "FARADON" trade mark and ready for commercial use. Dependable, efficient products are the result.

U. S. Army, U. S. Navy, Bureau of Standards, General Electric Co., Radio Corp. of America, Tropical Radio Telegraph Co., Westinghouse Electric & Mfg. Co., and Western Electric Co., are some of the large Faradon users.

Advise for what purpose condenser equipment is wanted and literature describing such types will be forwarded promptly.

TO SET MANUFACTURERS

We will promptly quote on your condenser specifications. State capacities, flash test, and operating voltage requirements and space available.

WIRELESS SPECIALTY APPARATUS COMPANY
Jamaica Plain Est. 1907 Boston Mass., U. S. A

LYNCH METALLIZED FIXED RESISTORS

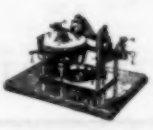
ARE WARRANTED—

Absolutely Noiseless
Permanently Accurate
Dependable!

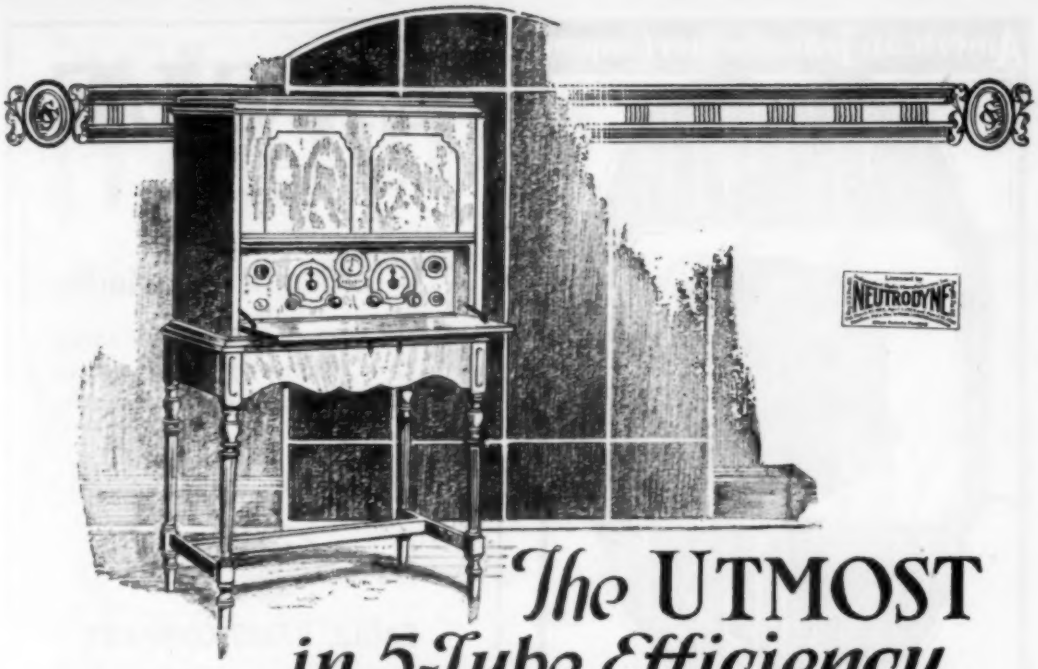
Write us!

ARTHUR H. LYNCH, Inc.
Manufacturers of Radio Devices
Fisk Bldg., Broadway & 57th Street
New York, N.Y.

Learn the Code at Home With the Omnigraph



Morse and Wireless—taught at home in half usual time and at trifling cost. Omnigraph Automatic Transmitter will send, on Sounder or Buzzer, unlimited messages, any speed, just as expert operator would. Adopted by U. S. Govt. and used by leading Universities, Colleges, Technical and Telegraph Schools throughout U. S. Catalog free. **Omnigraph Mfg. Co. 13M Hudson St., New York**



The UTMOST in 5-Tube Efficiency

Rare Tone Quality and Extreme Stability feature this new 5-tube instrument. Heavy copper cans completely encase each coil, preventing any possibility of local pick-up on the coils themselves, and permitting total neutralization of each radio frequency stage—with consequent freedom from distortion.

An emergency vernier adjustment—which permits a compensating movement of the third condenser—supplements the two regular tuning controls and makes possible the elimination of interference caused by two stations of but slightly different wave lengths.

Either house current, batteries or a combination of both may be utilized for operating power—all controllable by the battery switch when used with a Stromberg-Carlson Power Switching Relay.

For audio amplification apparatus, either internal amplification with UX-112 tubes or UX-171 tubes may be chosen, or where auditorium volume is desired, external amplification with a super-power amplifier can be used.

No. 5-A Cone Speaker. Tip-Top Table type. Violin wood soundboard finished in Mahogany. Pedestal solid Mahogany. Price $35.00. Licensed under Lektophone patents, 1271527 and 1271529. Other patents pending.

5-TUBE RECEIVER PRICES

Console type, shown above,
No. 502 Receiver, Art Console, American Walnut. 5-tube, coils shielded, dual control, equipped with voltmeter, space for all operating equipment.

	East of Rockies	Rockies and West
Price	$325	$355

(Receiver price is less accessories)

Also made in table model,
No. 501 Receiver, Treasure Chest, Solid Mahogany. 5-tube, coils shielded, dual control, equipped with voltmeter.

	East of Rockies	Rockies and West
Price	$180.00	$192.50

(Receiver price is less accessories)

The Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.

Stromberg-Carlson

Makers of voice transmission and voice reception apparatus for more than 30 years

American Transformer Company

The AmerTran DeLuxe

in two types for 1st and 2nd stages **$10** *each*

Standing out prominently among recent developments toward better reproduction, the AmerTran DeLuxe sets an entirely new standard of audio amplification.

Here is an audio transformer which reproduces the deep boom of the bass drum, the roll of the pipe organ and the lowest tones of the bass viol with startling realism, at no sacrifice of the highest sounds within the audible range. Used in connection with the new cone speakers and new tubes these transformers amplify uniformly over the entire audible range. The approach to absolute perfection is so close that the human ear is unable to note further improvement.

The AmerTran DeLuxe is made in two types —first and second stages and should be used by the pair!

The AmerTran Power Transformer and the AmerChoke are the result of over twenty-five years' experience in transformer building. They are among the finest units available for the construction of a power supply of the better type. The Power Transformer has filament supply windings for the rectifying tube and furnishes sufficient plate current, after rectification, for the operation of the set.

Write today for interesting free booklet "Improving the Audio Amplifier" and other data on the subject of better radio.

AMERICAN TRANSFORMER CO.
178 Emmet Street Newark, N. J.

AmerTran Products are Sold Only at Authorized AmerTran Dealers

Transformer Builders for Over Twenty-Five Years

EAGLE

Licensed by NEUTRODYNE

All That's Best in Radio

Eagle Owners have the satisfaction of knowing they have the best Radio Receiver made, regardless of cost.

Ask Your Dealer

EAGLE RADIO COMPANY
16 Boyden Place Newark, N. J.

The New Tobe Transmitting Condensers

The ideal Condenser for Transmitting Plate-Supply Use

Mfd.	1000 volts.	2000 Volts
.1	1.50	2.50
.25	2.00	
.5	3.00	4.00
1.	4.00	4.75
2.	6.00	8.00

The 1000-volt condensers are fitted with heavy brass binding posts; the 2000-volt condensers have heavy brass binding posts with petticoat insulators.
Each condenser is tested and the capacities guaranteed within 5% of ratings.
The 2 mfds. 1000-volt condensers are especially adapted for and used in the Amertran Power Packs. **Sent Prepaid Upon Receipt of Price.**

M. B. S. SALES CO., Dept. D. 27 School St., Boston, Mass.

Parts and supplies for Edison element storage "B" batteries in stock for immediate delivery. Perfect elements. Electrically welded on strip connectors. Type "A", 5c per pair. Type 3-G, 1500 M. A. 6c. Type 5-G 3000 M. A. 9c. ¾x6" flat bottom jars, 3c. 1x6", 4c. No. 20 pure nickel wire, 1c per ft. No. 18, 1½c. Separators, 4c per doz. Potassium Hydroxide and Lithium for making 5 lbs. Edison solution, 85c. 100 volt battery in steel case, complete in every detail, $12.50. 140 volt, $17.00. Send for complete list.

J. ZIED, 904 N. 5th ST., PHILA., PA.

stop that howl!

SEE that rubber jacket about to descend on the "howler"? Once this "howl absorber" slips over a tube the howl stops for once and all!

No more ruined reception. The thick shield of live rubber effectually soaks up the trouble-making vibration.

You can get it for every size tube!

Just ask your dealer, or write.

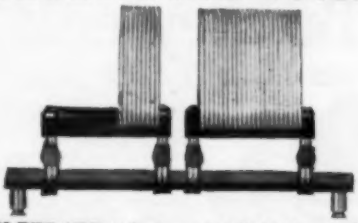
Ask for McDonald Howl Arrester

PRICE 75 CENTS EACH

National Distributors for the U. S. A.
SPARTAN ELECTRIC CORPORATION
350 West 34th Street, New York City

Manufactured in the U. S. A. by
SCIENTIFIC PRODUCTS CANADA, LTD.

SHORT WAVE COILS



COMPLETE SET—5 Coils and 2-Coil Mounting. 10 to 235 mtrs. " " " " " $5.00
Antenna Coil and attachment $1.00 additional
From your Ham Dealer,—or direct
Other Good Short Wave Parts. Send for List
SEATTLE RADIO LABORATORY
3338 33d Avenue, South Seattle, Wash.

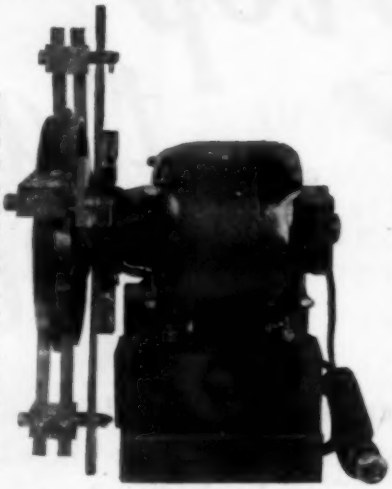
AEROVOX
"Built Better"
RAYTHEON CONDENSER BLOCKS

AEROVOX products are used by over 200 of America's Radio Manufacturers
AEROVOX Fixed Condensers are approved by M. I. T. and Yale Universities
AEROVOX WIRELESS CORP.
489-491-493 Broome St., New York

THE SUPER SYNC

The Synchronous Rectifier That Can Be Filtered

The Super Sync is now in use in several foreign countries and giving the same excellent results as those in this country. Several amateur stations after installing the Super have communicated with foreign stations that they were unable to reach before. A letter in our files from Clair Foster of 6 HM claims that after installing the Super Sync he was able to carry on reliable consistent communication with O-A3E, thus proving the reliability of the Super.



The super has an eight inch commutator which is turned at a synchronous speed by a ¼ H. P. 1800 R. P. M. Synchronous motor. The brushes are made of copper leaf and run on a smooth surface the entire circumference of the commutator. There are no air gaps in this type disk thus insuring perfect contact between brush and commutator at all times.

PAT. PENDING

PRICE $75.00 F. O. B. ST. LOUIS

MARLO ELECTRIC CO., 5241 Botanical Ave., St. Louis, Mo.

GENUINE

Kenotron Rectifying Tubes Model UV-216

THESE Tubes are the GENUINE R.C.A. Kenotron Rectifying tubes.

Filament voltage 7½ volts and will safely stand A.C. input of 750 volts. Four of these tubes will run a 50 watter.

These Rectifying tubes will pass plenty of current and voltage for your TRANSMITTER and also are very efficient for use in "B" ELIMINATORS.

STANDARD BASE. EVERY TUBE BRAND NEW AND PACKED IN ORIGINAL CARTONS.

List price $7.50 ea.—**Extra Special $1.85 ea.**

AMERICAN SALES CO., 21 Warren Street, N. Y. C.

Save 20 to 50%!

ORDER NOW!

Try Us for prompt and careful attention, immediate delivery and courteous service.

LOWEST PRICES for DRILLED, ENGRAVED or DECORATED PANELS or SUB PANELS for the popular standard circuits, for short wave receivers or transmitters; or specially cut, drilled and engraved TO YOUR OWN SPECIFICATION.

CORTLANDT PANEL ENGRAVING CO.

79 CORTLANDT STREET, NEW YORK

Bradleyleak

THE PERFECT GRID LEAK

Provides a noiseless range of grid leak resistance from ¼ to 10 megohms. Assures most effective grid leak resistance value for *all* tubes. Small grid condenser (0.00025) is separate. Metal parts nickel plated. One hole mounting.

Allen-Bradley Co.

Electric Controlling Apparatus

277 Greenfield Ave., Milwaukee, Wis

ABSOLUTELY! MISTER AMATEUR
WE HAVE THE MOST ASTOUNDING VALUES

CARDWELL CONDENSERS

King-Cardwell 41 plate
Easily doubled spaced for transmitting 95c.
King-Cardwell 11 plate
For short wave receivers 95c.
King-Cardwell Transmitting
Factory rebuilt for 3000 volts $2.95
King-Cardwell Dual Condenser, 15-15 pl.
Used in grid-meter drive $1.95

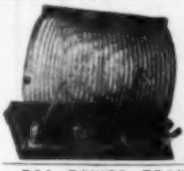
TUBES

Rectifying tubes will stand 500 volts and pass 60 mils
Half wave type 95c
Full wave type $1.25
RADIO CORPORATION GENUINE 201
An excellent tube for the short wave transmitter 95c

RCA UC-1803 FARADON CONDENSER
Capacity ..00025 Mfd. 10,000 volt breakdown
List $5.00
SPECIALLY PRICED AT 95c

RCA AUDIO TRANSFORMER UV712

Highly recommended by Kruse for short wave audio amplification. This peaked audio transformer was made to amplify a 1000 cycle tone without "dragging."
LIST PRICE $7.00 OUR PRICE $1.60



RCA OSCILLATION TRANSFORMER, UL 1008

Can be easily converted for short wave transmission by cutting out a turn. Works perfect for a Hartley circuit.
LIST PRICE $11.00 Our Price $7.50

RCA POWER TRANSFORMER UP1016

Has plate, filament, and rectifying tube windings. Plate side 3000 volts with midtap for 1500 volts. Filament and rectifying tube windings 10.5 volts with midtap at 5.25 volts. For low power tubes a rheostat in the primary circuit gives complete control of output.
List Price, $38.50 Our Price, $11.50

RCA TF TRANSMITTER, 20 WATT

This transmitter designed for CW or voice and it can be easily converted for operation on 40 or 80 meters. Housed in a beautiful cabinet with meter on panel.
SPECIAL $75.00

RADIO SURPLUS CORPORATION 250 WASHINGTON STREET BOSTON, MASSACHUSETTS

The *New* Hammarlund "MIDLINE"

Avoids Crowding at Any Part of the Scale

Condenser Will Improve Your Radio

It gives greater separation of low-wave stations than the old "SLC" type and greater separation on the high waves than the more recent "SLF" type.

In addition to the many famous features in previous Hammarlund models, the "MIDLINE" has ball and cone bearings and a full-floating rotor shaft. This shaft may be removed and a longer shaft inserted for use in any scheme of multiple condenser operation.

Made in all standard capacities—single, dual, and triple. Also for short-wave work.

Sold by the better dealers.

HAMMARLUND MANUFACTURING CO.
424-438 W. 33rd Street, New York

For Better Radio
Hammarlund
PRECISION
PRODUCTS

Precision!

Scientific precision of a high order enters into the manufacture of the Durham Metallized Resistor, developed by two leading university professors. Noiseless and guaranteed to maintain, under all conditions, the resistance marked on its label.

500 ohms to 10,000 ohms.....$1.00
Above 10,000 ohms to .24 meg..... .75
.25 meg. to 10 meg..... .50

RESISTOR MOUNTING

Made of moulded insulation of exceptionally high resistance. Best quality tension-spring, bronze contacts. Only upright mounting made.

Single Mounting.....50c
For Condenser.....65c

DURHAM METALLIZED RESISTORS

INTERNATIONAL RESISTANCE CO.,
Dept. B Perry Bldg., Philadelphia, Pa.

CARTER

"HI-OHM" Volume Control and Filament Switch

500,000 ohm
300,000
200,000
100,000
50,000
10,000
Resistances

$2.50 Complete with arrow pointed knob.

Simplifies the operation of the set and eliminates the battery switch. As soon as the knob is turned from "Off" position, the filament switch is closed and remains closed until the "HI-OHM" is turned off.

Have you seen the new all-metal frame "Midget" Rheostat combined with Filament Switch—all resistances **$1.00.**

R.M.A. ***Any dealer can supply***

In Canada—Carter Radio Co., Limited, Toronto

Carter Radio Co.
300 S. PEORIA AVENUE
CHICAGO, ILL. U.S.A.

Sacrifice Sale of Amplifiers

Large stock of metal "flower-type" horns, excellent amplifiers or loud-speakers, priced below cost for quick disposal. For particulars and prices write

Salvage Division
VICTOR TALKING MACHINE COMPANY
Camden, N. J.

Airplane flame proof Blinker Key CQ-1140, at $4.00. SE 1012-A. S. W. Reg. Receiver, 1 tube, 50-1000 meters, $40.00. TUBES. CQ. 888. Fil. 3. 3-4. 4V: Amps. 0.91; 3 prong base Socket Pin is 4th Terminal. $1.50 ea. 70-2500 Meter Wavemeter, Type 2500-B-2. Complete. 3 coils, graphs, meter indicator, $40.00. Just a sample of our bargains. Get our new and latest reduced price list for a 2c stamp. We bought $10,000.00 worth of United States Government Radio Transmitting and Receiving Sets and Parts. Mail orders sent all over the world.

WEIL'S CURIOSITY SHOP 20 South 2nd Street, Philadelphia, Pa.

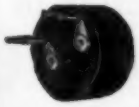
"Radio" with Volume and Distance

A "COLYTT" Adjustable Grid-Leak improves receiving. Proper value of leak in grid circuit—gives greater distance—louder and clearer signals.

Try a "COLYTT" Grid-Leak tonight. MONEY BACK GUARANTEE. Sent postpaid with full directions for $1.00.

THE COLYTT LABORATORIES
565 West Washington Street, CHICAGO, ILL.

WESTON *"Pin-Jack Voltmeter" with* HIGH RANGE STAND



Rear showing adjustable pin terminals.

Dials showing double scale for filament and battery voltages.

Plugging voltmeter into High Range Stand for battery testing

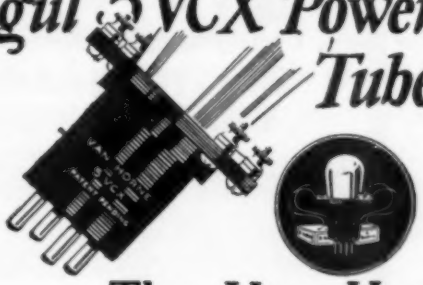
Testing "B" Battery with the Pin-Jack Voltmeter and High Range Stand.

The advantage of a Weston Voltmeter for positive set control is well known. Here is a new combination—two instruments in one—a Pin-Jack Voltmeter and a High Range Stand. Simply plug the Pin-Jack Voltmeter into the filament Pin-Jacks on the panel and you measure tube filament voltage—remove it and plug it into the High Range Stand and you can measure battery voltages up to 160 volts! ¶ The results — tube economy, longer battery life, better all-around set operation. ¶ The new Weston Pin-Jack Voltmeter and High Range Stand is a typical Weston product designed especially for the Radio Expert and Enthusiast. ¶ For complete information write us for Bulletin "O".

WESTON ELECTRICAL INSTRUMENT CORPORATION
158 Weston Avenue, Newark, N. J.

STANDARD THE WORLD OVER
WESTON
Pioneers since 1888

No Change in Wiring — with the adapted Mogul 5 VCX Power Tube



An Adapted Mogul 5 VCX power tube—as easy to apply as an ordinary tube—has almost double the signal carrying capacity of the ordinary tube. This greater capacity eliminates overloading and distortion and it can be applied to any set without change in wiring.

With an Adapted Mogul 5 VCX power tube in your set you will immediately note an unusual improvement—a general increase in volume, a roundness of tone and clear cut reproduction in voice and music that is unobtainable when ordinary tubes are used.

ONE USER SAYS—

"Let me congratulate you on the splendid performance of Adapted Mogul 5 VCX Power Amplifier Tube. I found that these tubes give remarkable amplification and clarity. The tube actually gives considerable increase in volume when used without additional plate voltage or grid bias. But when 135 volts is applied to the plate the volume is virtually doubled."

PUT ONE ON YOUR SET TONIGHT!

The Van Horne Co., Inc.
91 Center St. Franklin, Ohio

MICA TRANSMITTING CONDENSERS
.002 MFD. 6000 VOLTS
Manufactured by Connecticut Telephone & Electric Co.
Used As Grid, Radio Frequency By-Pass and Plate Blocking Condenser
EXTRA SPECIAL PRICE $2.00 Each
AMERICAN SALES CO. 21 Warren St. N. Y. C.

Very Special--

DeForest 20 Watt Transmitting Tubes, former list $18.00, limited quantity at **$12.00 each postpaid**
Filament 10 volts, 2.35 amps. Plate 750-1000 volts, 40-50 MA. As described on page 87, June QST. Discounts to bona-fide dealers.

E. F. JOHNSON COMPANY
9ALD
Waseca, Minnesota.

If you desire a superior high frequency receiver or transmitter

Send for CWS Literature

Laboratory Tested, Extreme Results Guaranteed
Special Apparatus Developed

Chauncey Wing's Sons, 1-AOF 1-CDP 1-BNW Greenfield, Mass.

To Our Readers Who Are Not A. R. R. L. Members

Wouldn't you like to become a member of the American Radio Relay League? We need you in this big organization of radio amateurs, the only amateur association that does things. From your reading of *QST* you have gained a knowledge of the nature of the League and what it does, and you have read its purposes as set forth on page 6 of every issue. We would like to have you become a full-fledged member and add your strength to ours in the things we are undertaking for Amateur Radio, and incidentally you will have the membership edition of *QST* delivered at your door each month. A convenient application form is printed below—clip it out and mail it today.

.....1926

American Radio Relay League,
Hartford, Conn., U. S. A.

Being genuinely interested in Amateur Radio, I hereby apply for membership in the American Radio Relay League, and enclose $2.50 ($3 in foreign countries) in payment of one year's dues. This entitles me to receive *QST* for the same period. Please begin my subscription with the .....issue. Mail my Certificate of Membership and send *QST* to the following name and address.

.....

.....

.....

Station call, if any .....

Grade Operator's license, if any .....

Radio Clubs of which a member .....

Do you know a friend who is also interested in Amateur Radio, whose name you might give us so we may write him about the League? .....

..... Thanks!

R. F. Choke

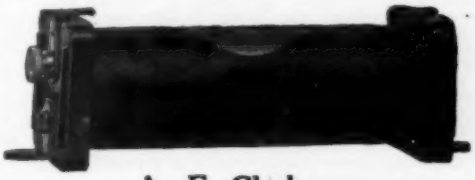
Only Samson Chokes can Stop all Distortion

Howling, "motor boating" and other distortion can be instantly stopped by Samson Chokes which have the patented helical winding. This makes them keep R.F. and A.F. currents where they belong at **all frequencies** particularly those frequencies where other types of chokes act as condensers and let these currents by. Samson Chokes have no pronounced resonance points.

Use the R.F. Chokes in grid circuits of first amplifier tubes, in B plus leads of R.F. tubes, in reflex circuits, and in place of resistance leak in resistance coupled amplifiers. Use the Audio Frequency Choke in the B plus leads to detector and amplifier tubes. By their use in such circuits B batteries will last much longer and "B" eliminators give much better quality of reproduction.

Conditions for Tone Quality Covered in New Booklet.

Audio Amplification, by Samson, contains full instructions for obtaining quality reception giving much, heretofore unpublished, research data of radio engineers. Send 25 cts. for copy complete with dozens of circuit diagrams.



A. F. Choke

Manufacturers Since 1882

SAMSON ELECTRIC CO.

Member RMA

Sales offices in Thirty Leading Cities.

CANTON MASS.

TOBE

TRANSMITTING CONDENSERS

The new line of TOBE Transmitting Condensers are made for working voltages of 1,000 and 2,000 volts. 1,000-volt condensers fitted with heavy brass binding posts. 2,000-volt condensers have petticoat insulators on the binding posts.

Capacity Mfds.	Type No.	PRICES 1,000 Volts	Ty	2,000 Volts
.1	1001	$1.50	2001	$2.50
.25	1002	$2.00	—	—
.5	1005	$3.00	2005	$4.00
1.0	1010	$4.00	2010	$4.75
2.0	1020	$6.00	2020	$8.00

We should be glad to send these condensers, post paid, on your request, accompanied by check or money order.

TOBE DEUTSCHMANN CO.

CAMBRIDGE, MASS.

Learn to Send the Easy Way

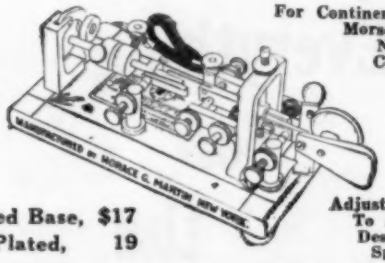
With The Improved Martin

Reg. Trade Marks Vibroplex Bug Lightning Bug

VIBROPLEX

Trade Mark Reg. U. S. Pat. Offs.

For Continental, Morse or Navy Codes



Japanned Base, $17
Nickel-Plated, 19

Adjustable To Any Desired Speed

Over 100,000 operators use the Improved Vibroplex because it is **EASIER, QUICKER** and **MORE ACCURATE** than the old key.

It transmits with amazing ease. **CLEAR, CLEAN-CUT** signals at any desired speed. Saves the arm. Prevents cramp, and enables any operator to send with the skill of an expert.

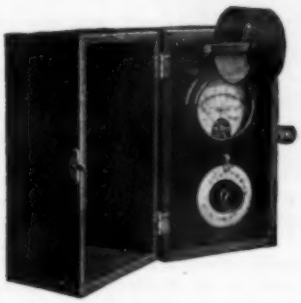
Special Radio Model

Equipped with Large Specially Constructed Contact Points. Requires no relay **$25**

Every amateur needs this bug. Easy to learn. Sent on receipt of price. Money order or registered mail. Liberal allowance on your old (Martin) Bug. Order Now!

THE VIBROPLEX CO., Inc.,
825 Broadway, New York

GROSS WAVEMETER



A high grade precision instrument at 1/3 the usual market price. Built into compact carrying case of genuine solid oak, leather handle on top with removable cover. Coils extremely low loss making a very low resistance wavemeter either the flash lamp or galvanometer type will easily respond to an oscillator using 50 volts or less on the plate of the tube. Coils fit into holder in the cover. Calibration better than 1% guaranteed. Checked against Piezo oscillator using a minimum of 10 points for each curve, no imaginary curves drawn from 3 or 4 points. Separate curve furnished with each coil.

Type 1—L—with flash lamp indicator for 20, 40, 80 meter bands. $15

Type 2—L—with flash lamp indicator for 20, 40, 80 and 200 meter bands $18.75

Type 1—G—with galvanometer indicator for 20, 40, 80 meter bands $30

Type 2—G—with galvanometer indicator for 20, 40, 80 and 200 meter bands $33.75

J. GROSS & CO.

30 Park Place - - New York City

DYNEX FOR DX

Everything For the Ham

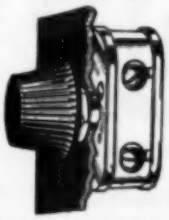
Nicholson Electric Co.,

1407 First North Street

SYRACUSE, - - N. Y.

Bradleystat

PERFECT FILAMENT CONTROL



Provides complete noiseless filament control for all radio tubes without change of connections. Metal parts are nickel plated. One hole mounting. Self contained switch opens battery circuit when desired.

Allen-Bradley Co.

Electric Controlling Apparatus

277 Greenfield Avenue

Milwaukee, Wis.

Become a Radio Operator

See The World. Earn a Good Income. Avoid Hard Work.

Learn in the Second Port U. S. A.

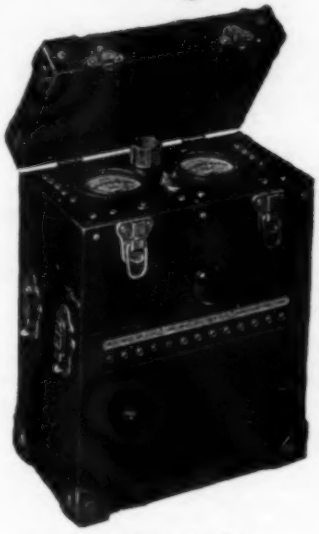
Radio Inspector located here. Positions plentiful. Splendid Climate. Other advantages to the student unequalled in any other American port.

Nearly 100 per cent of operators graduating on Gulf during past four years trained by MR. CLEMMONS, Supervisor of Instruction. Every graduate secures position.

Day and Night Classes; enroll anytime. Write for Circular; Department TWO.

GULF RADIO SCHOOL 844 Howard Avenue, New Orleans, La.

JEWELL



Jewel Radio Service Set
No. 117

Service—

In addition to their relay work the amateurs of the world are contributing substantially to the development of the radio industry.
Wherever we find them in a radio factory, jobbing establishment or dealer store, we know that they are spreading a story of **more intelligent operation and care of radio-sets.**
Service is the hobby of most amateurs.
Let us send you a copy of our No. 700 circular describing the Jewell Radio Service Test Set.

Jewell Electrical Instrument Co.
1650 Walnut Street
CHICAGO

26 Years Making Good Instruments

Heavy-Duty RADIOHM *for* Simple Control *of* B-Battery Eliminator

A Centralab Heavy-Duty Radiohm insures efficiency. Full resistance variation with a single turn of knob, allowing panel marking for proper setting to provide various voltages. **Tested and approved by the Raytheon Laboratories.** Resistance remains permanent as adjusted—no carbon particles or discs. Insulation withstands 1500 volts. The smooth, noiseless operation greatly improves any set.

$2 At your dealer's, or mailed direct, $2

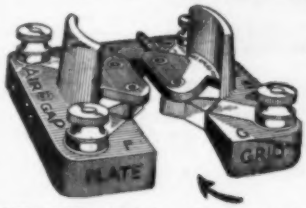
CENTRAL RADIO LABORATORIES
20 Keefe Ave. Milwaukee, Wis

Australian Representative—United Distributors, Ltd., Sydney. Canadian Representative—Irving W. Levine, Montreal. Great Britain Representative—R. A. Rothermel, Ltd., London.
Makers of a full line of variable resistances
69 manufacturers of leading standard sets.

Centralab CRL

"It gets that last mile"

The AIRGAP SOCKET



THE NEW
Low Capacity
U. X.
UNIVERSAL
Price 60c

See That Gap?

AIRGAPS will help rid any set of those squawks, howls and frying noises due to socket capacity; they keep the grids negative, stabilizing the circuit, causing tube to go into oscillations more smoothly and not "spill over" until maximum results are attained.
THEY HELP PREVENT closed circuit, absorption of current, intercoupling of circuits, feedback and undesirable capacity; they make any circuit more stable and sharpen tuning, resulting in purer and clearer tones with more volume on local and distant stations.

Sent Direct If Your Dealer Cannot Supply You. POSTPAID 60c EACH
AIRGAP PRODUCTS CO., MFR.
13 Campbell Street, Newark, New Jersey

The AIRGAP SOCKET
"It gets that last mile"

J. W. COLEMAN, JR. — J. W. DAVIS, JR.

COLEMAN & DAVIS
CONTRACTORS AND BUILDERS
PHONES: 5133-8302-Y
211 NORTH BROADWAY
LEXINGTON, KY.

Electric Specialty Co.,
Stamford, Conn. U.S.A.

July 26, 1926

Gentlemen:-

Some time ago I purchased from you an ESCO motor-generator set, 1000 volt 200 watt, 2 unit machine mounted on one base, and am writing you a few lines to let you know how much I think of your Generators.

The generator not only gives its rated voltage, but goes 100 volts better, putting out 1100 volts, and will stand a considerable overload for a good while. Am using it in connection with a fifty watt tube, and every night for the past two months, during the hotest part of the summer, have been working three or four Australians and New Zealanders.

When it comes to dx ESCO sure is the berries. The information on filters that you gave me several months ago, was highly acceptable, and no doubt accounts for some of my good dx this summer.

My signals have been heard and worked in every part of the globe in the last two months of summer and I credit it all to the keen note the ESCO generator puts out. My filter system is what you suggested, namely, 30 henry choke, and 6 mfd condensers.

Thanking you for past favors, I remain

Yours very truly,
J. W. Coleman, Jr.
9KF., Pre-War 9HJ., Sc.B., M.E.

The "Gold" Bug for the "Gang"!

ONLY $12.50
with cord and plug.
Carrying Case, $3.50
extra.

Here it is, the key that's being used all over the world, just the thing for the "gang." Simple in operation and easy to adjust. Made, guaranteed and sold on a money-back basis by an organization with over 40 years of experience in manufacturing transmitting apparatus.

You'll also be interested in a line of Jewell, Dubilier, Thordarson, Hammarlund and other nationally known equipment.

J. H. BUNNELL & COMPANY, INC.
Headquarters for Transmitting Apparatus Since 1878
32 Park Place, New York — Phone: Whitehall 5970

FAMOUS "BH" TRANSFORMERS
BH VIVAPHONIC
For quality of amplification, use the only Low-Loss, Shield Structure Audio transformer made. (Patented)
Write for Catalogue Illustrating Audio and Transmitting Transformers.
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298 Lagauchetiere St., W. Montreal, Canada
Transformer Builders Since 1910

POWER TRANSFORMERS
MODEL U. P. 1016
750 WATTS
Plate winding 2000 volts with 1500 volt center tap.
Also has filament windings for Radiotron and Kenotron tubes.
List $38.50 ea. SPECIAL PRICE $11.50 ea.
AMERICAN SALES CO. 21 Warren St., N. Y. C.

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST

HAM-ADS

NOTICE

Effective with the July issue of QST the policy of the "Ham Ad" Department was altered to conform more nearly to what it was originally intended that this department should be. It will be conducted strictly as a service to the members of the American Radio Relay League, and advertisements will be accepted under the following conditions.

(1) "Ham Ad" advertising will be accepted only from members of the American Radio Relay League.

(2) The signature of the advertisement must be the name of the individual member or his officially assigned call.

(3) Only one advertisement from an individual can be accepted for any issue of QST, and the advertisement must not exceed 100 words.

(4) Advertising shall be of a nature of interest to radio amateurs or experimenters in their pursuance of the art.

(5) No display of any character will be accepted, nor can any typographical arrangement, such as all or part capital letters, be used which would tend to make one advertisement stand out from the others.

(6) The "Ham Ad" rate is 7c per word. Remittance for full amount must accompany copy.

(7) Closing date: the 25th of second month preceding publication date.

THE life blood of your set—plate power. Powerful, permanent, infinitely superior to dry cells, lead-acid Bs, B eliminators. Trouble-free, rugged, abuse proof, that's an Edison Steel-Alkaline Storage, B-Battery. Upset electrically welded pure nickel connectors insure absolute quiet. Lithium-Potassium solution (that's no lye). Complete, knock-down kits, parts, chargers. Glass tubes, shock-proof jars, peppy elements, pure nickel, anything you need. No. 12 solid copper enameled permanently perfect aerial wire 75c 100 ft. Make easy money with 10-battery service station charger. Details, full price list. Frank Murphy, Radio 8ML, 4837 Rockwood Road, Cleveland, Ohio.

25% to 35% discount to amateurs on receiving parts. No sets. Over two pounds data, circuits catalog — 25c, prepaid. Also exchange new receiving parts you want for new parts—what have you? Weekly data bulletin—$2.50 year, trial 20 weeks — $1.00. Fred Luther Kline, Kent, Ohio.

JEWELL meters 25% discount. We specialize on parts and carry a complete line of ham transmitting and receiving apparatus in addition to regular broadcast equipment. We carry in stock products of the best nationally known manufacturers, such as Acme, National, General Radio, Thordarson, Raytheon, Philco, Nathaniel Baldwin, Radio Engineering Laboratories, Cardwell, Allen Bradley, Tobe Deutschmann, Kellogg, Centralab, Yaxley, Acme Wire Company, Crescent Radio Company, M. M. Fleron, Aero Products, Inc. Tell us what you want. We allow discounts to A.R.R.L. members and dealers only. Give your call letters. Roy C. Stage, Wholesale Radio, Montgomery and Burt Sts., Syracuse, N. Y.

WANTED—a December 1922 QST. H. Wood, 1054 Elm, Warren, Ohio.

QSL cards. Gerald Julian, 424 Park Road, West Hartford, Connecticut. "Not always lowest in prices — but highest in quality."

AMATEURS. Big discounts on short-wave appartus. Western Electric 50 watters (limited supply) $27.00. Aero coil kits $10.75. For low-price list write 2APJ, 643-5 West 171st Street, New York City.

8FN's CHEMICALS sure are F. B. for charging B Batteries and B Units and for high voltage rectifiers where aluminum and lead are used. No borax. 50c per box. Wm. Threm, 8FN, 2325 Vine St., Cincinnati, Ohio.

AMATEUR radio equipment built to a quality standard, not a price. E-R-L equipment is built of the finest material and is guaranteed. We use your parts if desired in any equipment. Our line is transmitters, receivers, master oscillator units, wavemeters, etc. Our new Marine type equipment for use on sea-going yachts or cruisers. Special equipment to order. Thos. Ensall, 1208 Grandview Avenue, Warren, Ohio. Radio 8BDN.

HAMS! Write for our catalog of complete line of transmitting and receiving equipment. Ron L. Wollard, Newark, Ohio.

GE aeroplane dynamotor, Dubilier filter, 12 DC-400 DC $14. 2ALN.

BETTER Edison elements. Welded connections, 7c pair. Sample cell 10c. Paul Mills, Woodburn, Oregon.

WESTERN Electric 7-A power amplifier with horn and tubes, excellent condition $50. Ed. G. Raser, 315 Beechwood Ave., Trenton, N. J.

UV202 for sale. Been used one month. $5.00. Charles Stevens, Stafford Springs, Conn. 1BMG.

WANTED—Several broken or burnt out WE-VT 4 fifty watters. D. M. Ashby, Gibson City, Illinois.

OMNIGRAPH wanted—state type, number, condition and price. 7AV.

DODGE Radio Shortkut fixes signals in mind to stick. Kills Hesitation; "Speeds Up" to 25 per quickly—easily. Appendix to Shortkut senders rapid progress more certain. Key Work by 8DRI-KUF cultivates legible transmission. Bad "fist" prevented or corrected—Take advice from KUF. Key Work and Appendix $1.50. But if purchased Shortkut only and now copy less than 25 per special price will be One Dollar—specl dely mail; none COD—Money Order only. Dodge Radio Shortkut with Appendix and Key Work $3.50 U. S. and Canada—Elsewhere $4.00—reg. mail. Terms as above. C. K. Dodge, Mamaroneck, New York.

49c TRANSMITTING rheostats for 5-7.5 watt tubes. 3 for $1.25. New VT2 tubes $4.50. Joseph Neubauer, 1220 Pine Street, Philadelphia, Pennsylvania.

QSL cards printed on Government post cards. Two colors, 100 for $2.15, 200 for $4.00. Full amount must accompany manuscript, including postage. Samuel Singer, 157 Thatford Ave., Brooklyn, N. Y. 2AIQ.

Curtis-Griffith "Curgri-Co" or Roice 5-watt DX Babies $3.15 postpaid with free callbook. Mueller 150-watt input tubes $15.00 socket free. Federal Buzzers $2.75. Potter 2000-volt 1-MFD filter condensers $2.50; 2500-volt 1-MFD filter condensers $3.25. Raytheon Tubes $6.00. (Discounts to bona-fide dealers—give references.) New "Ham-list" with latest transmitting circuits, parts, etc., 4c. Price Griffith, 1109 Eighth Avenue, Fort Worth, Texas.

BEST offer takes new Philco glass-cased storage battery. Blaine Davis, Duquesne, Pennsylvania.

WANTED — Westinghouse detector amplifier, unit type DA. George Woodbury, Union City, Indiana.

FOR sale—my entire equipment. Condensers, meters, transformers, etc. Send for list. Harold Cerny, Belle Plaine, Iowa. 9BJX.

BALDWIN phones $5, Murdock phones $3, 0-15 Jewell voltmeter $5, 8 volt Thordarson Transformer $5, Thordarson Power transformer for 5 watter $3, C302 tube $1, transmitting grid leak 75c, UC1014 and UC490 Condensers $1. Henry Meyer, Jr., Rockdale, Texas.

2CDH—Castleton, N. Y., selling out new 50 watt parts cheap.

---

450 WATT Thordarson transformer. New. 3000 v tapped, $16.00. 9BOS.

WHILE they last, genuine brand new R.C.A. UV202 five watters, $2.45. James Marinell, 725 Oak Street, Youngstown, Ohio.

FOR sale—New Marlo super-sync rectifier. Guaranteed perfect condition. $56.00. 9DQU, 1538 N. Edward, Decatur, Illinois.

MUST sell. Going to school. 15 watt 40 meter set with tubes $20. 15 watt CW fone set $30. Esco 500 v dynamotor with rheostat $40. Tubes, meters, chokes. Write for particulars. 9BIF.

WANTED—A 0-1500 voltmeter (good condition). Write William Crim, 2295 Broadway, San Francisco, Calif.

FILTER chokes unmounted 20H 25 M.A. $1.00—30 H 50 M.A. $1.50—50H 60 M.A. $2.00. 275V transformer from 110 $2.00. Use two for Raytheon tube, 420V secondary with midtap and 6V primary with midtap from 110 mounted $4.00. All prepaid three zones. Write for list of other parts. M. Leitch, 32 Park Drive, West Orange, N. J.

PURE aluminum and lead rectifier elements, holes drilled, brass screws and nuts, pair 1/16", 1" x 4", 13c, 1 x 6 15c, 1¼ x 6 17c, 1½ x 6 19c. Sheet aluminum 1/16" $1.00, ¼" $1.90. Lead $1.00 square foot all prepaid. Silicon transformer steel cut to order .014". 10 lbs. 25 cents, 5 lbs. 30 cents, less than 5 lbs. 35 cents per lb. 4 cubic inches to the lb. Postage extra. ½ cash with order—balance C.O.D. Edgewise wound copper ribbon .350" wide; 3¼" outside diameter 10c turn, 4¼" 13c turn, 5¼" 15c turn, 6¼" 17c turn, 7¼" 20c turn, prepaid. Geo. Schulz, Calumet, Michigan.

FOR Sale—the following at 6FC: Jewell 0-5 TC $6.50; Acme inductance, $1.25; Acme 1½ henry 500 mil double choke, $3.50; UC1803, 75c; UC1846, $1.00; W.E. 2 mfd. filter condensers, $1.00; 1 mfd., 75c; UC1831 variables, $1.10, Autoformers, $3.45; 1 mfd. Dubilier receiving condensers, 55c; Bremer Tully BCL Tuner, $3.00; Accuratune dial, $2.00; Marco dial, $1.00; Bradleystat, $1.25; Dictograph Loud Speaker with Baldwin unit, $6.50. Wanted: Weston or Jewell panel mounting galvanometer. Walter Kempton, 1010 Bath St., Santa Barbara, Calif.

WAVEMETERS: Rigidly built; Bakelite panels and coils; not in cabinets; good condensers and solid coils bulb indicators; curve charts furnished, read in tenths of meters at short waves; accuracy guaranteed within ½ of 1%; no floppy leads to change calibration. This is all the dope. One band $5.00 postpaid, $1.50 extra per additional band. Edw. Bromley, Whitewater, Wis. 9CSM.

SELL—Esco 8/500 volt dynamotor. 9CJH.

READ 'em and weep—Thordarson 450 watt 1500 each side of center, fifteen bucks. Jewell D.C. milliammeter, 0-300, five berries, radio frequency 0-5, $7.00, and A.C. filament volts 0-15, $5.00. What have you got, OM? 8CFZ, S. C. Granger, LeRoy, N. Y.

FOR low power, 400 volts 3000 mil. Willard element storage B. batteries, best offer. Acme 200 watt transformer new $15.00. Thordarson 80 watt filament transformer $5.00. 2 UX210's $4.00. 1 UX216 B $4.00. Want good synchronous rectifier or 1500 volt M.G. 8AMT, R. Burrows, 3107 Durbin Place, Cincinnati, Ohio.

GE dynomotor 24 volt input 1500 volt output, at .233 amp. with extended shaft, $18.00. 700 watt power transformer has 1500 volt center tapped winding. Two 12 volt windings with center taps, $7.00. Two UV217 Kenotrons with sockets, $15.00. Filament transformer 150 watt 12 volt secondary with primary rheostat, $5.00. Jewell T.C. ammeter 4.5 in. diameter 0 to 10 amp. $5.00. Henry Barth, 3723 S. Jefferson Ave., St. Louis, Missouri.

QRH?? You will be able to answer accurately if you have a General Radio 358 wavemeter. Range 14 to 224 meters, each of four coils separately calibrated. A ruggedly built, scientifically accurate wavemeter, and in stock, price $22.00. Send immediately for descriptive leaflet. 5000 ohm grid leaks with center tap, $2.00. Commercial ammonium phosphate pound cartons .50c. .002 Mica grid condensers, 3000 volts $2.50. One mfd. 1750 volt filter condensers, $2.50. Fifty watt porcelain base sockets, $2.50. YOU should have our price list. It's free for the asking. Harris, 5RM, 104 East 10th St., Fort Worth, Texas.

1000 OMNIGRAPHS wanted. "S" tubes, transmitting tubes, transformers, chokes, vibroplexes, receivers, transmitters, bought, sold. 9CMS, L. J. Ryan, Hannibal, Missouri.

FOR sale—My complete amateur station 3BTA. Motor generator, 7½-250 watt crystal control transmitter, receiver, storage A and B batteries. Everything for some real ham. New UV204A used less than 5 hours. Will sell all for $700. First check wins. Write for list. B. R. Barker, Gladwyne, Penn.

For that winter DX—Thordarson power transformers 350-550 each side $11.00; 1000-1500 each side $15.00; 80-watt filament transformers $6.00. Thordarson 650-volt power-filament transformers for 5-watters $6.90. Curtis-Griffith 250-watt power-filament transformers 550 each side $12.50. Edgewise wound copper strip 6-inch size per turn 12c; 4-inch per turn 10c. Aluminum square foot 85c; Lead square foot 85c. Jewell 0-15 AC voltmeters $7.50; 0-500 milliammeters $7.50. Power grid-leaks $1.60. Aerovox 1500 volt 1-mfd. filter condensers $1.75. Get a new "Ham-list" 4c. Service—That's me. James Radio Curtis, 5-A-Q-C, 1109 Eighth Avenue, Fort Worth, Texas.

REPRESENTATIVES wanted—Every set owner is a live prospect for our fully guaranteed 180 volt "B" Power Unit. Sells for $25.00. Liberal commissions. George R. Downs, 755 Carlton Avenue, St. Paul, Minnesota.

CRESCENT Lavite transmitting grid leaks 5000 ohms $1.95. R.E.L. Inductances, double $8.90; single unit $4.60. Bremer-Tully Short wave Outfits with Coils (12½ to 200 meters) $6.90. Signal Wireless Practice Sets $2.75. ¼ K.W. Wireless Keys $2.25. Sterling Voltammeters, 0-50 volts; 0-35 amperes $2.85. National and Cardwell Condensers. Many other bargains. Write for list. M. B. Spinoza, 27 School St., Boston, Mass.

NEW W. E. fifty watters $26.00. UC1014, 3000 volt, .002 mfd. condensers $1.80 Amertran apparatus, power transformer, PF52, $13.00. De Luxe transformers, $15.00 per pair. Chokes $5.00. Resistance units available. Peanut "N" tubes $2.50. 2BYJ.

TRADE or sell for short wave receiver or transmitter. Kennedy Universal new, Omnigraph 2 Oliver Typewriter Binoculars and telescope. What can you do for me? George Bryce, Bristol, Conn.

FOR Sale New Westinghouse double commutator 750 V. 200 W. D. C. generators direct connected to 110 V. 60 cycle A. C. Motor $45.00. Field rheostat $4.50 each extra. 25% with order, balance C. O. D. Express Inspection allowed. Also other voltages and capacities. James J. Smat, 1734 Grand Ave., Chicago, Ill.

WHEN it comes to Amateur transmitting and receiving apparatus, there's one place you're sure to get dependable goods, quick service, and fair prices We can't tell all about it here, but 9ALD's "Hamalog" ,the original and still the best Ham Catalog, is waiting for you with all the dope. Send for it today—it's free. Remember we rent Omnigraphs at low rates. Special discounts on an overstock of genuine General Radio wavemeters. See our display ad regarding DeForest 20-watt tubes. E. F. Johnson, Waseca, Minn., 9ALD.

MOTOR generator. Westinghouse 1000 volt 250 watt, motor 110 volt 60 cycle. Field rheostat. Good condition, $67. 8DGV, 1169 E. 145 Street, Cleveland, Ohio.

NEW generators, 275-volt 120-watt. Fine for phone, $8. UC1831 variable condensers, $1.50. 1803 $1.50. 200-watt 500 cycles used generators $10. ½-KW $15. 12-step inductances type 111E maximum 11000 meters $3. 1250 honeycombs 75c. Radio Corporation 750-watt transformers $11. 150-watt filament 10½ volts $4.50. No. 14 enameled $4.75 per 1000 ft. Code recorder $20. VT ones $2. VT twos $4. Western Electric microphones $1. 2mfd. condensers tested at 400 volts $1. Postage or express extra. Enclose stamp for list. R. Wood, 46-20 102 St., (38 Way Ave.) Corona, N. Y.

NEW Brandes superior phones $2.79 a pair. Signal variable condensers all sizes .78 each. Send for my bulletin of bargains for the ham. 9MV, Story City, Iowa.

HAMS! Announcing "Callzeard", a monthly pamphlet consisting only of calls heard and worked lists from all parts of the world. First issue January. Price only fifteen pennies per copy, $1.50 per year. Published by hams for hams. We can't do it without help from you. Won't you endorse it by sending us your lists and subscription? Published by 3FI and 3ABH. It's for you, men. Don't delay. Send subscriptions now to 2857 North Bailey Street, Philadelphia, Penn.

AMATEUR radio equipment built to a quality standard, not a price. E-R-L equipment is built of the finest material and is guaranteed. We use your parts, if desired, in any equipment. Our line is transmitters, receivers, master oscillator units, wavemeters, etc. Our new marine type equipment for use on sea going yachts or cruisers. Special equipment to order. Thos. Ensall, 1208 Grandview Ave., Warren, Ohio. Radio 8BDN.

TANTALUM strip for rectifiers—radically new universally variable condensers—cross wound coils for Superheterodyne transformers and R.F. Chokes—Government long wave receivers, air condensers for transmitters, and Edison B B 4 batteries—2200-volt transformers—quartz crystals—Peaked 10 to 1 audios—Superhet & Power transformers—Transmitter B Eliminators—A B Eliminator parts—Chokes any size iron or air core—Filter condensers—Oscillator wavemeter drivers from battery or A.C.—Loud speaker coupling chokes and transformers—Jewell meters—Sales representatives wanted—Give Call for Catalog & Disct.

Charles O. Snyder. Richmond, Indiana.

FOR sale—Westinghouse type T. F. 20 watt phone and C. W. transmitter complete with 500 volt motor generator—tubes, microphone—key, $75. Jack Woodard, Douglas, Georgia.

(Continued on Page 93)

NAVY standard compass receivers, SE1440A, 150-1250 meters equipped with detector, 3 stages audio, $200. 10/500 volts Navy dynamotors, $20. Navy 900 cycle alternators, self-excited, $20. Western Electric 50 watters, $32.00—250 watts, $95. UV204, $85—UV203A, $31.00—UV203, $20. Dubilier mica condensers 8500v—.004 new $7.50. Western Electric 2B superheterodyne receiver, 180-600 meters, special $200. Complete with tubes and loop. U. S. Navy CW 936 transmitter receiver, brand new, original case—complete $180. Weston meters 15% of list. Long wave navy receivers CN. 240, $65. Navy wavemeter 100-4000 meters, bargain $85. Arthur Faske, 1515 Eastern Parkway, Brooklyn, N. Y.

RADIO specials—Federal filter condensers—650 volts DC, $1.35. Federal filter condensers—1000 volts DC, $1.80. Federal power transformer—500 watt CW—1160 volts between outer wires. Filament winding 11 volts $26.00. Radio catalog free on request. 25% discount on receiving apparatus. I. C. Patchin, 525 Park Avenue, Kent, Ohio.

Q R A SECTION

50c straight, with copy in following address form only: CALL—NAME—ADDRESS.

1AZJ—Jack Bean, 27 Adam Street, Pittsfield, Mass.

1BR—M. G. McCarroll, Technology Dormitory, Cambridge, Mass.

1CJH—Roy B. Fuller, 30 Harrison Street, Pawtucket, R. I.

1CNG—118th Observation Squadron, Air Corps, Connecticut National Guard, Brainard Field, Hartford, Conn.

1CNP—Everett L. Roberts, 5 Summer Street, Orono, Maine.

1JZ—Devereaux Martin, 21 Garland Ave., Malden, Mass.

1ZA—C. E. Jeffrey, Jr., 725 Commonwealth Ave., Newton Center, Massachusetts.

2ABO—William T. Finney, 58 Simonson Ave., Mariner's Harbor, Staten Island, N. Y.

2ABP—William Brady, 2521 Woodbine Street, Ridgewood, Brooklyn, N. Y.

2MK—E. F. Raynolds, Central Valley, Orange County, New York.

4FO—C. A. Davis, P. O. Box 668, Winter Haven, Florida.

4HA—Eugene L. Feagin, 226 Hyman Ave., Hendersonville, N. C.

4SP—James B. Witt, 832 N. 5th Avenue, Knoxville, Tennessee.

6ACQ—Walter James Robertson, 2015 South California Street, Stockton, California.

6AEX—David L. Bigley, 836-54 Street, Oakland, California.

6AZS—William C. Crim, Apt. 7, 2295 Broadway, San Francisco, California.

6CNX—Lawrence Johnson, Ephraim, Utah.

6CUA—Dr. J. W. McElwee, Box 333, 1362 Paseo Del Mar, San Pedro, California.

7AAC—M. A. Frye, Heppner, Oregon.

7GC—Geo. DeWitt Line, Sterling, Idaho.

8AZD—Edward C. Brichta, 3393 Williams Ave., Detroit, Michigan.

9AQZ—E. L. Aschinger, 1005 S. Bloomington Street, Streator, Illinois.

9ARN—John S. Roelfs, Jr., Bartonville, Illinois.

9BWJ—(Ex 8DOV)—Edwin E. Hare, 550 Brown Street, Paintsville, Kentucky.

9CHD—Ralph E. Skyles, 702 Carson Avenue, La Junta, Colorado.

9CKF—Frank Colclough, Box 211, Philip, South Dakota.

c3VH—A. R. Williams, 56 Madison Ave., Toronto, Ontario, Canada.

nPB3—H. A. Veringa, 8 Gerard Schaepstraat, Amsterdam, Holland.

The following stations belong to members of the A.R.R.L. Headquarters gang. Mail for them should be addressed care A.R.R.L., Hartford, Conn.

1MK Headquarters	1DQ John M. Clayton
1AL H. P. Westman	1ES A. A. Hebert
1BAO R. S. Kruse	1KP F. Cheyney Beekley
1BDI F. E. Handy	1OA R. S. Kruse
1BHW K. B. Warner	1SZ C. C. Rodimon

PRICES TALK — Immediate—Reliable—Service. Thordarson combined plate and filament transformers. Ideal for 5 and 7½ watt transmitters. Has 650 volt and 10 volt filament with center taps. Special $6.45. Every make of power transformer at low bargain prices. RCA-UC1803 condensers 10,000 volt breakdown, great for Hartley Circuit blocking and grid condensers $.50. RCA UC 1846 condensers, the berries for tuned plate and grid transmitters (KFUH circuit) 10,000 volt $1.00. Tobe Deutchmann 4 MFD 1000 volt filter condensers. Special $4.65.

Genuine Cardwell 23 plate condensers $1.25, 43 plate $1.95. Cardwell 21 plate transmitting double spaced condenser .0002 MFD $3.95. Jewell 3 inch flush type voltmeters and milliammeters $6.45. Thermocouple antenna meters $10.35. New General Radio Wavemeter type 358 $19.50. 15 dial latest model omnigraph $26.50. Special 5 dial omnigraph combined with key, buzzer and coil, $50 list, Special $25.00. Aero short wave coil kit $9.75. R.E.L. receiving coil kit $3.85. R.E.L. transmitting inductances, double complete with clips and coupling rods $9.45. Single unit $4.65. Send for complete list of parts. All apparatus brand new and fully guaranteed. Deal with a brother ham and save your shekels.

2MA 207 Neptune Ave., Brooklyn, N. Y.

SEE THAT SCREW

A screw driver - adjusts an - XL in crowded places.

X-L VARIO DENSER

Results in easier tuning, more distance, volume and clarity—greater stability. Indorsed by leading radio authorities.

Model "N"
A slight turn obtains correct tube oscillation on all tuned radio frequency circuits. Neutrodyne, Robers two tube, Browning-Drake, McMurdo Silver's Knockout, etc., capacity range 1.8 to 20 micro-microfarads. Price **$1.00**

Model "G"
with grid clips obtains the proper grid capacity on Cockaday circuits, filter and intermediate frequency tuning in heterodyne and positive grid bias in all sets. Capacity range

Model G-1
.00002 to .0001 mfd.

Model G-5
.0001 to .0005 mfd.

Model G-10 .0003 to .001 M. f. d.
Price $1.50

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"They last twice as long as the smaller batteries of equal voltage"

"THAT's a pretty broad statement, Tom. Won't you have to make it conditional on the number of tubes in the set or the use of the new power tubes?"

"No, sir! Under the same operating conditions—whether you use four, five tubes or more, whether you use a power tube that uses up to 135 volts, the Eveready Heavy-Duty No. 770 or the even longer-lived Eveready Layerbilt No. 486 will last twice as long as the smaller sized 45-volt batteries."

"Well, they ought to, they cost more."

"Yes, about a third more—but lasting twice as long as the smaller batteries, they cost much less."

"Your arithmetic is good, Tom, but if that's so, when I bought my set why did the dealer equip it with the smaller Eveready 772? Why didn't he put in the Eveready Heavy-Duty Batteries?"

"He probably thought he was doing you a favor — making your first investment cost you a little less. That little difference looks like a lot to a good many folks who are buying their first set, equipped with tubes, loud speaker, 'A' and 'B' batteries and everything."

Heavy-Duty batteries last twice as long as the smaller batteries of equal voltage. Eveready Heavy-Duty Batteries are the great contribution that the world's foremost electro-chemical laboratory has made in "B" battery economy, dependability and satisfaction, and the satisfactory reception of radio programs.

Dry "B" batteries give a noiseless current, pure D. C. (direct current), the kind that is essential if you prize pure tone.

Send for booklet, "Choosing and Using the Right Radio Batteries," which we will be glad to send you upon request. This booklet also tells about the proper battery equipment for use with the new power tubes. There's an Eveready dealer nearby.

LEFT - Eveready Layerbilt No. 486.

RIGHT - Eveready Dry Cell Radio "A" Battery, 1½ volts.

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Radio Batteries
-they last longer

NOTE: A "C" battery gives a quality of reception unobtainable without it and greatly increases the life of your "B" batteries.

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WFI—*Philadelphia*
WGR—*Buffalo*
WCAE—*Pittsburgh*
WHAI—*Cincinnati*
WTAM—*Cleveland*
WWJ—*Detroit*
WGN—*Chicago*
WOO—*Davenport*
WCCO { *Minneapolis* / *St. Paul*
KSD—*St. Louis*
WRC—*Washington*

after all...

"OLD FRIENDS ARE BEST"

IN THE years that have flown since Acme pioneered in transmitting (in those days when "amateur" meant amateur) we have tried to keep faith with our staunch old friends of Q. S. T.

Looking back now, we feel old. Almost every name that used to mean something in the manufacture of transmitting apparatus has disappeared—or deserted to the purely receiving field.

Acme, almost alone, still sticks to the ship—still tries to keep faith with its old friends. And yet, while holding and serving its old friends, Acme has kept pace with radio progress.

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Claude Hairns

President, Acme Apparatus Company
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ACME *–for amplification*

The Communications Department

F. E. Handy, Communications Manager
1711 Park St., Hartford, Conn.

The Month with Expeditions

VOQ

OPERATOR ED MANLEY of the Putnam Arctic Expedition reports that almost all of his traffic for the last month was handled from North Upernivik through 9CP, the station of Mr. J. R. Miller at Hammond, Ind. Contact has been next to perfect even when VOQ used the low powered emergency outfit provided with Everendy B batteries for plate supply. Signals from the Schooner Morrissey of the expedition have been worked using both the twenty and forty meter wavelength bands.

The thrilling story of the week of trouble when the Morrissey ran aground at high tide near Whale Sound has long since been in the newspapers so we will not repeat it here. The efforts of every member of the expedition saved the ship after hope had been practically given up. During the time when the Schooner was on a submerged rock the radio outfit was not used much, as the batteries could not be recharged and it seemed best to conserve the power supply of the main outfit until the very last. It gave a comfortable feeling of security unknown to explorers a decade ago, to have available the means of communication with friends. It did not become necessary to make use of either the main or emergency sets to call for help, but everything was on hand with which to do so if the party had had to abandon ship 1,000 miles from the nearest settlement where help could be secured.

A radiogram sent A.R.R.L. Headquarters by Manley contains a list of amateurs worked up to August 22. This list is quite able to speak for itself. Practically every part of the country is represented. Manley says that in three trips made from Upernavik to Whale Sound results have been duplicated except for local disturbances. North of Cape York the signals fell off noticeably, VOQ getting out best from Melville Bay. The list follows:

1FD, 1FL, 1AAO, 1PA, 1HJ, 1CMP, 1BKQ, 1ACI, 1AAY, 2BNZ, 2CRB, 2AEV, 2NZ, 2NF, 2UO, 3ZO, 3MV, pr4RL, 4JS, 5QL, 5ATA, 6JP, 7AIM, 7MN, 7RL, 7TK, 8AIP, 8EW, 8AJN, 8ZAE, 8BPQ, 9KD, 9EJI, 9ZT, 9KB, 9CTG, 9BJK, 9CP, 9CPQ, 9CKS, c1AR, c2BE, KGBB, VYG, DG1x1.

Since August 22 when Miller (9CP) left his station for a month's vacation in the West, the Morrissey has been coming farther south. The usual quantities of traffic and press have been put through 2NZ, 1CCZ, 2AGQ, 3AHA, 2AAN, 2UO and 2CTH. Although 9CP will not be on the air again until the week of September 19th, there is none of the old worry that we will lose contact. Dozens of stations are ready standing-by and eager to take traffic.

2NZ thought he could stay off the air for at least a couple of months after his strenuous watches with KEGK, but he is back and hard at it again, keeping a daily watch to clear the hook at VOQ between 10 and 11 p.m. E.S.T. A thousand words of press have been handled in two weeks. Sometimes 2NZ and 1CCZ copy together to make repeats unnecessary. When the A-bat went dead at 2NZ on one occasion, Hendricks of 1CCZ took the press on schedule and QSRed to Strout on a later schedule. 9ADS tried to give Manley a lift on some of the traffic on one occasion but his pet power leak started and he was forced to QSK. 2ACQ reports that VOQ is on every night after 9.45 p.m. E.S.T., and that VOQ usually works on 37 meters. 1AAY, c4DQ, 3MV, 4JS, 5ADY, 9FI, 9CET, 9CKS and 9DCK all report VOQ very good. There is sometimes a "fluttery" D.C. note but not often bad QSS. The sigs have the wabbly CW characteristic of any small ship when at sea. The operator of f8JN copied VOQ on a ten foot indoor antenna August 1 when she was at Whale Sound.

WNP

The MacMillan expedition contact has been good, also. 1ZK and 1AAY still take most of the messages for New England. Most of the Chicago traffic went through these eastern stations up to September first when WNP hooked 9CEJ in Chicago. 1ZK handled over ten thousand words up to September 7th in 227 official messages. All the messages in his file make a very complete and interesting story of the expedition. 1ZK's message tally shows 3449 words sent and 6871 received! (not to mention the various service messages).

1AAY handled about 182 messages with expeditions, keeping schedules with both WNP and KGBB. About 2500 words per week went through 1AAY. Messages for Maine and Illinois points were forwarded by radio via 1BIG and 9AAW. This month the Bowdoin and the Sachem Third are on their way south. As we write, it is expected that the Bowdoin will dock at Wiscasset, Maine, about September eleventh. The photograph we show this month is that of 1AAY at

the Cambridge, Mass., location. This outfit connected with WNP before being set up at the summer QRA. The expedition contact from 1AAY mentioned this month was all performed from Holyoke, Mass. Gold tells us that although this is probably the last of the work for WNP and KGBB, he is planning to carry on from Cambridge again when he gets back there this fall. He says that the M.I.T. location throws an R7 signal into Brazil. When there isn't much studying to be done, he stands a good chance of connecting with the Roosevelt Memorial Expedition (GMD), whose schedules were given here last month.

9CXC in Chicago handled several messages with WNP and is keeping a schedule for further traffic. 2GYX took a couple of WNP messages and forwarded them by radio, also making a schedule. 1FL took some from WNP through bad QRM but had better luck later in the month, taking ten messages totalling about 700 words from KGBB. He says that KGBB has the same note as WNP but without the wabble to it. 9DNG doesn't agree to this. In his report of working KGBB he reports the signals very unsteady. Probably both are right and 9DNG worked the expedition AT SEA. 1CJ, 6BMW, 8eNT, 1BMS, 8BHM,

9DMA, c1CO, 1AVL, 1BFT, 2APJ, 1AYL 9AEK and 9EFS all worked WNP during the past month. 8CEO, 4JS, 2BO, 8CXW, 8BKM and 3MV copied WNP at different times. BE3 (Mr. A. R. Williams, Nyack, Warwick East, Bermuda, B.W.I. ex c3VH-9CS) reported WNP with an audibility of R3, unsteady and having a poor note. How long before Arctic expeditions use crystal control? Williams says it's a radio paradise in Bermuda after living in a dead-spot like Toronto. September 10, 9CKS took one from WNP, sending it on to Chicago via 9APN.

On September 5, WNP put on some radiophone entertainment for the benefit of 1ZK and 9CEJ and for anyone else who might be interested. Commander MacMillan spoke and thanked all the amateurs who had helped to make life in the Arctic so different from what it was on his first trips. At the time of the test program, the Bowdoin was anchored off Nova Scotia in St. Peter's Canal. Abe Bromfield, who is coming to the U. S. for a year, gave an idea of how the Eskimo language sounds, relating his first humorous impressions of civilization when he landed at Sydney.

WCDN

Early in October, a new expedition will be on the air. The Chicago Field Museum and Chicago Daily News are sending an expedition to Abyssinia on the east coast of Africa (50° East Longitude and just a few degrees North of the Equator). The Abyssinian expedition will use the regular type of battery-supplied equipment and will probably operate in both 40-meter and 80-meter wavelength bands. Amateurs in the United States and in foreign countries as well are depended on to do the usual fine work in handling contact messages and news dispatches from the expedition. As the sending set will be a low powered one, it remains to be seen whether much of the traffic will be handled direct or whether it will come via the fellows in South Africa or in the Mediterranean countries. Most of the messages will be put on the air during the early evening hours—Abyssinian time of course. Press should be sent one of the nearest Chicago News offices by the amateurs handling it. If not relayed by radio to the Chicago Daily News, Chicago, Ill., through U. S. amateurs, it should be delivered to other offices of the same newspaper located at 25 Piazza Mignanelli, Rome, Italy, or at 10 Boulevard des Capucines, Place de Opera, Paris, France. Here is an opportunity to work a station in a new part of the world, handling traffic for and giving worth while service to another group of explorers, otherwise entirely out of touch with civilization.

Hop to it, fellows. Keep your ears open for WCDN, GMD, or VOQ and take their traffic from whichever part of the world they may be located. Any special schedules, changes in plans, or further information received on these expeditions will be given out through A.R.R.L. Official Broadcasts and in the Official Relay Station bulletin. Don't forget to send in a report for *QST* when you work or handle traffic with expeditions. Who is going to be the first to hook up with GMD and WCDN, the two latest expeditions out?

9AYW, 9EIR, 8BCQ and 8CEO worked WAP during the month. WAP is the S.S. Peary on a month's cruise, located at MacGregor Bay, Ontario, Canada when worked. WAP was using a wavelength of about 40 meters.

NAVY DAY TELEGRAPHIC BROADCASTS

NAVY DAY will be officially observed on October 27, just as last year, under the auspices of the Navy League of the United States, with the Navy sponsoring the celebration and lending all possible assistance. Many amateurs belong to the Naval Reserve and some of us have enjoyed a pleasant summer cruise, getting fine experience afloat with naval radio equipment. Others have been stationed at land stations for a few weeks, while still others have participated in radio drills from some of the stations located at the Headquarters of a Naval District. of the Battle Fleet, Commander in Chief U. S. Fleet, Commander of U. S. Naval Forces in Europe, Commandant of the Seventh Naval District, Lt.-Comdr. Wm. J. Lee U.S.N.R., and Lt.-Comdr. F. H. Schnell U.S.N.R., operating the two Master Stations of the Naval Reserve, and Lieutenant-Commander Maxim U.S.N.R., and President of our A.R.R.L., will all have special messages for amateurs that will be released on Navy Day from different stations at different times in accordance with the following schedules:

Station	Call	Freq. (kcs)	W.L.(m.)	TIME (EST & GMT)	Mes.	From
Key West, Florida.	NAR	8710	34.9	8:00-8:20 p m	0100	Comdt. 7th N. D.
Washington, D. C.	NKF	8030	37.3	8:20-8:40 p m	0120	Sec'y of Navy
Winter Park, Florida.	NRRG	3683-7594	82.0 39.5	8:40-9:00 p m (simultaneously on both waves)	0140	Lt.-Cmdr. W. J. Lee, U.S.N.R.
USS Memphis, in European waters	NISS	8770	34.1	9:00-9:20 p m	0200	Comdr. U. S. N. Forces, Europe
Madison, Wisconsin.	NRRL	7800	38.4	9:20-9:40 p m	0220	Lt. Comdr. F. H. Schnell, U.S.N.R.
Puget Sound, Washington.	NPC	8110	37.0	9:40-10:00 p m	0240	C-in-C, Battle Fleet
San Francisco, California.	NPG	8070	37.2	10:00-10:20 p m	0300	C-in-C, U. S. Fleet
Hartford, Conn.	1AW	7692	39.0	10:20-10:40 p m	0320	Lt.-Comdr. H. P. Maxim, U.S.N.R.

The program has been arranged carefully so that there are as few "overlapping" transmissions as possible. Every reader of *QST* has an equal chance to get on the Navy Day Honor Roll, which will be made up for *QST* from the names of operators copying the several messages and reporting the text to A.R.R.L. Headquarters. The more messages you copy and forward to "HQ," the greater the chance that you will be one of the high men to receive special commendation from the Secretary of the Navy.

However, Navy Day broadcasts give us all an opportunity to show interest and pride in our Navy.

Last year the Official Relay Stations received advance notice of Navy Day broadcasts. Many of them entered the Navy Day competition and were listed in the Navy Day Honor Roll printed in December *QST*. The operators who made the best record by copying all or nearly all of the several different broadcasts sent, received a letter of commendation from the Chief of Naval Operations. This year we have the schedules for *QST* and everyone who reads this announcement is invited to enter a similar competition.

The Secretary of the Navy, Commander in Chief

Let's show the Navy Department that we are able to do the usual good jog of everything we undertake. In about two hours and a half, all the messages will get on the air. How many will YOU turn in at Hartford for the final count? Please listen-in on the proper wavelengths on Navy Day, October 27, copy what you can, and mail it the next morning to A.R.R.L. Headquarters, Attention of the Communications Department. This will show us that you have keen ears, that your wavemeter is accurate and your tuner sensitive, and it will enter you in the Navy Day competition, giving you a place on the Honor Roll.

Army Amateur Notes

2ND CORPS AREA—The organization of Auxiliary Radio Nets is progressing very well, everyone showing an interest and co-operating in every respect. It should be clear to everyone by now that any amateur can belong to the Naval Reserve as well as to the Army Radio Nets without any obligations requiring him to belong exclusively to either branch of service. Amateurs who have hesitated about applying for appointments due to belonging to the Naval Reserve should hesitate no longer as there is nothing to prevent their station being part of an Army-Amateur Radio Net at the same time.

2SC keeps daily schedules between six and twelve P.M. using a 77 meter, crystal-controlled set on Governors Island. All A-A work so far as possible will be conducted on wavelengths between 75 and 78 meters in this Corps Area.

Following is a list of the Auxiliary Nets that have been formed together with the principal and alternate N.C.S. in charge:

Bronx, 2CYX (P), 2APV (A); Manhattan, 2EV (P), 2ABT (A); Brooklyn and Staten Island, 2PF (P), 2CLA (A); Long Island, 2AKV (P), 2KG (A); Eastern New York, 2PV (P), 2AGM (A); Western New York, 8HJ (P), 8ATR (A); New Jersey, 2ZB (P). The N.C. S. are organizing the stations that have been appointed in their respective nets. All amateurs assigned to these nets are now receiving their certificates, code charts and other instruction on procedure. Get information from your Net Control Station or send requests for information and applications for appointment to your Army-Amateur Representative, Mr. David Talley, 2PF, 2222 Ave. O., Brooklyn, N. Y.

4TH CORPS AREA — A big proposition was put over in a big way by amateurs in the Fourth Corps Area. When the 122nd Infantry of the National Guard of Georgia went on its regular annual encampment at Tybee Island, Georgia, 4RM, 4FC and ex4FF were on hand to do their part in keeping the camp in communication with Headquarters at Atlanta. At Atlanta, 4SI handled the work very capably, making possible all that was accomplished in message-handling. A 50-watt bottle in a Hartley circuit was supplied by a 750-volt dynamotor. Six and twelve-volt storage batteries were used for filament supply and to push the dynamotor. On arriving at camp at 5 A.M. the tent was put up and also the two 20-foot gutterpipe masts. By 10 A. M. there were two amperes in the antenna and on listening on the pre-arranged hourly schedule with 4SI, the gang were elated to hear him calling frantically. Answering in approved fashion brought no results—speaking of life's darkest moments. After further unsuccessful attempts the gang held a consultation, deciding that as the rainpipe was a true vertical radiator, that the 40-meter signals were jumping over Atlanta due to "skipped-distance" effect. 4RM was left at the tent while the others ate chow and decided to try the receiving antenna on the transmitter (the high end was about 12 feet off the ground). Right after the noon schedule, came the first successful QSO using this arrangement. Later, a better antenna was strung between two telegraph poles which brought in better reports. Regular schedules were kept with 4SI, only two being missed during the whole period of encampment. Several antennas were tried and some of the schedules were kept on 80 meters where less trouble from fading was noted when clouds obscured the sun.

A total of 542 messages were handled in both directions, the messages being delivered by telephone in Atlanta and answers returned on the next schedule. Several emergency messages were handled. One to the Chief of Police caught a man who had stolen a lot of money and taken the train to Atlanta. Two for Fort Screvens were handled via 4RM-4SI-WVR, and answers returned over the same route when the long wave set was unable to get in touch with Washington, D. C. All supplies were ordered by radio and all *rush* official business was handled, as it was found that radiograms got replies in between ten and twenty minutes time, while the Western Union took about two hours each way to do the job. Everyone concerned is to be congratulated on putting over a real worthwhile achievement.

5TH CORPS AREA—Sgt. Stark of the 38th Signal Company, National Guard, at Camp Knox, Ky., tells us that in putting 9GX on the air, empty Coca Cola bottles were used as insulators and the set got out to Australia and the Philippines the first night. 9ADK, 9CPQ, 9BCC, 9DUC, 9BCA and 9EAI are all at Camp Knox operating at 9GX regularly.

FR5 is the U.S. Army experimental station located at the Headquarters of the 7th Observation Squadron, France Field, Canal Zone, and operated by H. S. Cronkhite. FR5 may be heard right below the 40-meter band and Lieut. Dowman, Signal Supply Officer guarantees that all cards received will be promptly acknowledged.

6TH CORPS AREA—Most of the station in the Corps Area Net made a good showing for the month though service was crippled at some points where station-owners were away on vacations. At Milwaukee, 9DTK gets the gold star for most consistant service with 9VD a close second. 9AZN at LaCrosse gets the gold star for consistency with 9ZY right on his heels. Short-wave stations were put in operation during the summer at Camp Grant, Ill. and Camp Sparta, Wisc. 9DOX and 9AKY managed to QSO 9AFF with several messages from these points but had a difficult time of it. 8BMW at Detroit tried to keep on schedule but found some trouble in getting in touch on the scheduled nights.

The net stations at L-Ance and Lansing, Mich. handled their traffic through 9AAW, using 40 meters without any trouble. The official traffic included a number of coded messages. 9AFF wants to be able to report *every* Net Station on the job by the time of the next report. It is hard to tell when another station will want a relief but with everyone who volunteered his station for an Army Amateur Radio Station doing his duty, more messages can be handled between Corps Area HQ and the various Net Control Stations or their alternates.

7TH CORPS AREA—The new 9BAY is nearing completion and will be the Net Control Station of the Minnesota Army-Amateur Net. A 100 and 1,000 watt outfit is used on 40 meters and a 50 watt CW and phone set on 80 meters. Four operators on duty five nights a week will roll up the message figures. 9BAY is located at the Armory building in St. Paul.

McCord and Kock of 9BAY, together with 9BZP and 9DNX, did some notable work during the National Guard encampment (July 25-Aug. 9). Old 9BAY using 15 watts input and a 40-meter Zeppelin antenna was installed in a tent. In addition, a one-man portable transmitter and receiver was built into a suitcase 16" x 19" x 10". This grip carried everything including all batteries, two head-sets, antenna, and message blanks. A UV201A tube was used with Ford-coil power, giving a signal of R99 in camp and on one occasion covering 500 miles in daylight.

On several days, the portable was taken out in the field with the company and communication with camp established within five minutes. During these periods messages were put through in next to nothing, flat. The officers in charge were highly enthusiastic at the good results and message-handling efficiency obtained and the four "ops" received many compliments for the good work in this Corps area.

A Naval Reserve Communication Division similar to that formed in Florida by 4XE is now being organized in the 3rd Naval District. Drills start around Oct. 25th. All Communication Reservists in the states of New York, Vermont, Nothern New Jersey and Connecticut are requested to address Communication Division, U.S.N.R., Third Naval District, 1711 Park St., Hartford, Conn., for further details.

In the First Naval District the organization of a Communication Division of the Naval Reserve is also under way and some regular drills with tactical calls and Naval procedure is promised soon. 1KI, 1ATV, and 1BIG are the charter Maine members and when three more men have been enlisted from Maine or New Hampshire, the drills will start. Write the Maine Section Communications Manager, 13 East Crescent St., Augusta, Maine for details of the works planned.

If you live in Massachusetts get in touch with Mr. John M. Wells, 1ZD, Southbridge, Mass. 1BIG and 1ZD are commanding officers of units in their vicinities. Lt.-Comdr. Charles M. Kelly, Jr. U. S. N. R. is organizing the entire First Naval District so that regular radio drills may be conducted. It is expected that the state of Rhode Island will be taken care of next by a separate unit with Headquarters at Providence.

Club Activities

CALIFORNIA—The Southern California A.R.R.L. picnic was partly covered in these columns last month. We forgot to mention the novel fish-finding contest which was a feature of the picnic. It ended in a controversy as to whether frogs were fish which was not decided until 7SI awarded the 7½ watter to 6CMS. 6GD displayed his archery. Ex a5AP staged an apple eating contest which was won by 6JI. 6RM got the 1,000 cycle A.F. Transformer by winning the bum message contest. 6BLV gave two YL's life memberships in the Los Angeles Radio Club, and after an argument between 6BQR and 6CMQ for the honor of escorting Miss 7SI home the party went home tired but happy.

The Modesto Radio Club will award their Wouff Hong Trophy to the best sixth district station to be chosen at the coming Pacific Division A.R.R.L. Convention.

The Santa Clara County Amateur Radio Association will soon be on the air with a new transmitter. Probably a 250 watter will be used—call 6SV. The station will be on the air nightly, an amateur superstation with a corps of trained operators.

The San Francisco Gang got behind the Radio Show at San Francisco and put A.R.R.L. over in great shape. Heintz and Kohlmoos loaned a fine 100 watt transmitter and a receiver and all that was left to do was to install the apparatus in the booth that was obtained courtesy of Mr. Longeman and Mr. Heintz. 6BAA nearly landed in the jug and had special policemen tracing him all around the show. However, due to his native ham agility, he succeeded in eluding the mob and breaking open the sealed doors and he got the antenna wire out into the great open spaces. The rest was easy and traffic began to move as the first visitors trickled in. The station was licensed under the call 6EP for the week of the exhibit. 1134 messages were filed in the week and some of the local transmitters assisting 6EP are still hot trying to clear the hook like old times. Code cards were distributed to all visitors at the booth and a bunch of A.R.R.L. supplies were sold. The radio station and all the various signs and photos in

the booth made a hit with visitors and let everyone know about the A.R.R.L. and amateur radio in general. Among many prominent visitors was piCD8 and kingpin of them all, Don Wallace, 9ZT-6AM. 6AGT, 6VR and 6DDN are certainly on the honor roll as consistent brass pounders on the job 24 hours a day during the Show. Next month's traffic will show who pushed messages.

CONNECTICUT—At a recent meeting of the Twin City Radio Club, S.C.M. Nichols gave an interesting talk on "Traffic Handling," and following his suggestion the club members unanimously elected 1BHM as Route Manager of New Haven County. Plans have been worked out allotting different territories to the club members whereby schedules will be arranged with stations throughout New England. 1BHM will appreciate the cooperation of stations who can arrange schedules with one of the 20 New Haven and West Haven traffic stations. Write him. Letters are now going out to arrange some of the schedules. Operations began in earnest September 1st. Each member has been supplied with a blueprint showing all O.R.S. in Connecticut and when all the schedules are in operation, we hope to reproduce the map here. White call letters represent 40-meter stations and red is used to indicate 80-meter stations on these maps. Other clubs are cordially invited to write the Secretary. Communications regarding schedules with a view to making relay work more interesting and effective are also welcomed. Address Mr. R. H. McKendrick, 46 Center St., West Haven, Conn.

ILLINOIS—Mr. Lloyd Grenlie, chief op with the Byrd Arctic Expedition, and formerly of Bellevue, D. C., recently addressed the Chicago Radio Traffic Association, giving a very interesting story of the expedition and telling all about his experiences with crystal controlled transmitters and receivers. The attendance at summer meetings has averaged about 35. The fellows all had a good time at the last Peoria meeting. Another meeting is planned to be at Starved Rock, Ill., on Sept. 19, at which the Statewise organization will be taken up further.

INDIANA — The Indianapolis Radio Club had a picnic on Sugar Creek and 16 hams from Indianapolis and 5 from Louisville attended. The club's portable transmitter kept the gang in touch with the outside world. All had a big time and will QTA again this fall.

MICHIGAN—A representative bunch from Southern Michigan and Northern Ohio met at Monroe, Mich., (half-way between Detroit and Toledo), in mid-July, enjoying a fine dinner together and having an FB get-together meeting. 8ANE, 8AVX, 8AVB, 8BN, 8BEN, 8BMD, 8BQC, 8BRV, 8CEP, 8COW. 8CVO, 8DCB, 8LO, 8VT, 8WO, 8ZZ and 9ADZ were among those present. 9DXZ was visiting 8CEP with whom he has kept a schedule for about six months. It is planned to hold further meetings at frequent intervals.

MAINE—The Queen City Radio Club were recently given a clam bake and general good time by the Bar Harbor Radio Club. The Bangor gang were met at the steamship wharf by members of the B.H.R.C. and escorted by autos to 1BGS, the club's radio station. A drive to Sea Wall followed and after an inspection of the Navy Radio Station the bunch had an FB clam stew on the beach. 1BDB was the self-appointed steward, former C.P.O. at NBD during the war, and everything was planned out to a nicety. 1AQL, president of the Q.C.R.C., was awarded the championship for stowing away the stew. A trip around the island ended with an inspection of the compass station at Otter cliffs.

NEW YORK—The Radio Association of Western New York will again, as in the past two years, have a booth at the Radio Show of Buffalo, Oct. 16th to 23rd inclusive. In the past two years an approximate average of 100 messages were handled each day. As it is expected this average will be exceeded at the forthcoming show it is earnestly requested that Amateurs watch for traffic from Buffalo as much as possible during this time. Stations wishing to arrange schedules should write 8ADE, stating wavelengths and time their station will be available. This should be an opportunity for live stations to materially increase their message totals for October.

The Radio Club of Brooklyn has been holding informal meetings during the summer. Meetings will open in the fall with some excellent talks on crystal controlled transmitters.

NEW JERSEY — Don't forget the banquet to be held at Hotel St. Francis, Newark, N. J., Oct. 16th under the auspices of the Amateur Radio Association of Essex County. See these columns of September *QST* for full details. Come and bring someone with you, OM.

TEXAS—The Third Annual Hamfest of the Bexar County Radio Association was, as usual, a huge success. The gang visited Fort Sam Houston, the Bell Telephone Company's plant, broadcasting station WOAI, and several amateur stations, including 5HE. Visitors from all over the state were on deck and many took advantage of the chance to take the examination given by Radio Supervisor DuTreil, who came all the way from New Orleans to help. After a splendid four course dinner, 5UX acted as toastmaster. Addresses were made by President Fitzhugh and by the Radio Supervisor. The Army-Amateur Plan was discussed by Col. Gibbs, C.S.O. of the 8th Corps Area. The Communications Department organization was explained by S. C. McSahm, 5GW. A CQ contest, a code speed contest and a drawing contest were part of the program. 5ABQ provided music and movies for the gang. Capts. Stoner and Ellis of the Signal Corps and Mr. L. D. Wall, Army Amateur Representative, were present from Fort Sam Houston. The tables were equipped with buzzers and keys to serve those who find code easier than the spoken word. The radio dealers of Fort Worth and San Antonio generously provided prizes for the various contests. The event will long be remembered as a pleasant one. San Antonio hospitality is a splendid index to A.R.R.L. fraternalism and friendship.

OFFICIAL BROADCASTING STATIONS

YOUR attention is called to the Fall schedules of the League's Official Broadcasting Stations. These stations have agreed to observe the wavelengths and scheduled times of transmission, making it possible for you to select a station, to listen for him at a certain time and on a certain wavelength, and to receive the Official Broadcast. A good number of stations send the broadcast so you may "run across" a broadcaster in the course of ordinary listening. We hope to have a more complete list for publication in November *QST* and to announce a competition at a later date to determine the most consistent broadcaster and to find where and when the broadcast can be copied. As soon as enough additional Official Broadcasting Stations have been appointed by the S.C.M.s to make a contest profitable, the details will be announced.

Each week, the latest news of expeditions, schedules of tests that are being run and other important amateur news of the hour are made into a broadcast which is sent to operators of Official Broadcasting Stations weekly. The broadcast has a release date slightly later than the mailing date so that the material to be sent can be in the hands of each operator at the beginning of the week of release no matter in what part of the country he is located.

If you have a station that gets out well and feel that you can send the broadcast regularly at one of the three times a day noted at the head of the columns, by all means apply to your Section Communications Manager (his address is on page 3 of each *QST*) for appointment as O.B.S. giving him the information about your station. In particular, on the 18.7-21.4 and 150-200 meter bands more stations are needed in all parts of the country, especially in the seventh radio inspection district.

The operators of the various stations are willingly giving up part of their time to this work and will appreciate it if you will drop them a card saying that you copied the Official Broadcast from them on schedule.

O.B.S. are requested to send the broadcasts slowly enough so that they can be copied by beginners and with steady, even keying. A number of folks on the West Coast copy 6BJX's broadcast regularly one day a week, and a number of people listen to certain of the broadcasters right along *for code practise*. We will be pleased to receive any suggestions regarding ways of making this service through the Official Broadcasting Stations of still more interest and value to you. Only thus can we improve.

Call	Wavelength (Local Standard Time) 7.00 pm	10.30 pm	12.30 pm	Days of Transmission
1AYJ†††	——	——	——	——
1BEP	80	80	——	Mon., Fri.
1BFT	——	——	39	Sat., Sun.
1BIG§§	——	——	——	Mon., Wed., Fri.
1BQD	39.7	——	——	Daily
1CKP	——	39	——	Sat., Wed.
1GA	37.85	——	——	Tues., Thurs.
1GA	——	——	18.1	Sun.
1OC‡	83	——	——	Thurs., Fri., Sat.
1OC	83	83	——	Sat.
2APV	37.57	37.57	——	Mon., Thurs.
2CQZ	(special schedules on 40, 80 and 180 meters)			
2CTH‡‡	——	——	——	Tues., Thurs.
2PF	——	37.6	——	Mon.
3ALE	40	——	78	Mon., Fri.
3APV	——	——	20	Sun.
3BWJ	41.5	——	——	Mon., Wed., Fri.
3EL	40	——	——	Mon., Wed., Fri.
3EL	——	52.5	——	Wed.
3LL	38.1	——	——	Mon.
3XAN†	——	——	——	Mon., Thurs.
Pr-4JE	40	——	——	Tues., Sat.
4JR	84-39.3	——	——	Mon., Wed., Fri.
4OB	40	——	——	Wed., Fri.
4TR	40.03	40.03	——	Mon., Wed.
4TR	80.06	80.06	——	Tues.
5ACL	38.5	——	——	Sat.
5ACY	38.2	——	——	Wed., Sat.
5ADA	——	37.5	——	Sat.
5GJ	38	——	——	Mon., Thurs.
6ANO	41	——	——	Daily except Sun.
6BJX§	——	——	——	——
6BUC	——	39.75	——	Sat.
6CCT	——	39	39	Mon., Tues., Fri., Sat.
6CLP***	——	——	——	Sat.
6UO	——	80	——	Mon., Wed., Fri.
6VC**	——	——	——	Mon., Wed., Fri.
8BHM	42.5	85	170	Sun., Wed., Fri.
8BSU§§§	40	——	——	Mon., Fri.
8CEO	80	——	——	Mon., Wed., Fri.
8DME	38.5	——	——	Tues., Fri.
8ZH	76	——	——	Tues., Thurs.
9ADR	40	40	——	Thurs.
9ADR	——	——	20	Sun.
9AYK	79	——	79	Tues., Thurs.
9BKJ	39.5	——	——	Tues., Thurs., Sat.
9CET*	——	——	——	Mon., Thurs.
9CPO	40	——	——	Wed.
9CPO	——	40	——	Sat.
9CVR‡‡‡	——	——	——	Fri., Sat.
9DPJ	82	——	——	Mon., Wed.
9DPJ	——	——	38	Sun.
9DWK	200	——	——	Tues.
9DWK	——	200	——	Sat.
9DZI	38.5	——	37.8	Sun.
9DZR	80	——	——	Tues., Fri.
9EGU	37.5	——	——	Mon., Wed., Fri.
9HP	39	——	——	Tues., Fri.
9KZ	20	——	——	Mon., Wed., Fri.
9KZ	——	40	40-180	Sat.
9RR	——	82	——	Tues., Thurs.
9ZC	——	84	——	Sat.
WJBA	——	206.8	——	Mon.
WOAX (voice) ††	——	——	——	Tues., Fri.

* 11 pm, 38.6 m.
** 7.30 and 8.45 pm, 38 m.
*** 9.30 am, Sun.
§ 6 pm, daily except Sun., 40 m.
§§ 42.5 m., 6 pm.
§§§ 9.00 pm, 40 m.
† 12.25 pm, 38 m.
†† 12.20 pm, 240 m.
††† 8 and 12.45 pm. 41m.—8.30 and 80 m. Tues. Thurs., Fri., also 8.30 pm Sun. on 80 m.
‡ 6.00 pm.
‡‡ 6 pm and 9.30 pm, 38 m., 1 pm Sun., 19 m.
‡‡‡ 12 m., 38 meters.

NOTICE

To All A.R.R.L. Members of the Southern Minnesota Section of the Dakota Division

Mr. D. C. Wallace, 9ZT-XAX, your newly-elected Section Communciations Manager, has been forced to resign due to his changing his location to the Pacific Coast where he already is making plans to get a big "six" station on the air. Not only will 9ZT be missed by everyone but Wallace's change in location will be a distinct loss to the Section and to the entire Dakota Division. Your loss will be California's gain. Nevertheless that loss will be keenly felt.

Nominating petitions are hereby solicited in order that an election for an A.R.R.L. Section Communications Manager for the next two year term of office may be held in the Southern Minnesota Section in accordance with the Consitution. Five or more A.R.R.L. members living in any section have the privilege of nominating any member of the League in their Section as candidate for Section Communications Manager. The nominee and signers of the petition must be members of the League in good standing. There is no limit to the number of petitions that may be filed but no member shall sign more than one such petition. The proper form for nomination was shown on page 45 of April, 1926 *QST*. All such nominating petitions must be filed at League Headquarters, Hartford, Coon., by noon of Nov. 2, 1926 for the petition to be valid. Members are urged to take initiative and file nominating petitions immediately for the man of their choice.

—*F. E. Handy, Communications Manager.*

August 16th marked the formation of the New Zealand Association of Radio Transmitters. There has been need of an amateur society at the head of affairs in N. Z. for some time and now we are very happy to welcome the new organization. Mr. Shrimpton (2XA) has been elected President while the other officers are Mr. Jorbell (z1AX), Mr. Salt (z1XI), Mr. Browne (z3CQ), Miss Bell (z4AA), Mr. Crockett (z4AM), Vice-Presidents, and Mr. Roberts (z1AE), Secretary and Treasurer. Communications are welcomed and should be addressed to Mr. R. V. Roberts, Sec'y N.Z.A.R.T., Box 779, Auckland. N. Z. This information was received by radio via 5AUZ and z1AO and we hope that further reports come through in time for our I.A.R.U. columns next month.

John Berg, Jr.—9DWN
482 Willow Ave.
Pierre, So. Dak.
Orig. 21 Del. 27 Rel. 840 Total 888

BRASS POUNDERS' LEAGUE

Call	Orig.	Del.	Rel.	Total
9DWN	21	27	840	888
9EK	397	26	144	567
1BIG	92	122	317	531
8DHX	97	48	362	507
6BXC	48	44	245	337
9PU	14	36	279	329
6BJX	73	121	134	328
7PU	34	14	266	314
1BMS	82	64	197	304
8EU	28	42	202	272
1UE	47	59	164	270
8CMO	22	13	232	267
2APT	50	—	200	250
2CEP	56	8	143	207
9DTK	44	66	96	206
8BPL	1	7	17	180
6BXD	8	92	76	176
6BQ	58	57	60	175
9DZI	47	13	114	174
6AXW	113	28	32	173
3ZO-3CBT	9	1	162	172
9BIY	144	5	14	163
8BFE	9	12	140	161
2ADH	47	8	105	160
9BNP	23	14	123	160
1AUF	99	1	57	157
8BLP	60	17	78	155
9DOL	17	7	120	144
6BBQ	3	6	133	142
1ATV	52	16	64	132
8DBM	43	14	74	131
9CP	30	85	12	127
8BSZ	17	12	98	127
6BGV	29	6	88	123
8CW	23	10	90	122
6BUC	94	25	3	122
1BFZ	68	11	38	117
8CCQ	14	15	88	115
1BKV	20	4	90	114
1ABA	31	6	73	110
5ADO	100	4	1	105
1QZ	82	13	10	105
9AAU	8	7	89	104
9ARA	20	9	74	103
2AVB	44	8	50	102

9DWN, Route Manager of the South Dakota Section, proved that he was on the job. By virtue of operating a set eight hours per day, keeping 13 schedules on two wavelength bands, he rose from 7th to 1st place and rates the starred rectangle. Don Mix, operating at 9EK-9XH, takes second place this month, while 1BIG pulled up into third doing the usual fine consistent work. 9CAW, 9DKM and 1ZK could have been included above if the number of messages originated, delivered, relayed, and total had been turned in at Headquarters. Please send us all the information next time, OMs.

TRAFFIC SUMMARY BY SECTIONS

MORE messages were handled in August than during July but the percentage delivery hit a lower figure than for some time past. More messages were originated but fewer delivered.

The percent of all the Official Relay Stations under each official and the percent of TOTAL messages handled by each Section are included in the summary of this month's work. By comparing the columns showing these percentage figures, the standing of each Section is shown on a message-handling and reporting basis. If the percentage shown opposite YOUR name under "% ORS" is much greater than shown under "%MSGS" it means that some of the following things need to be done:

(1) Dead O.R.S. need to be cancelled.
(2) More live stations need to be appointed.
(3) Message lanes need to be formed covering important points in your territory. More schedules may help. Perhaps the fellows need to be urged to handle more messages. If your Route Managers have been appointed they can take steps to improve this situation.
(4) If the messages are being handled all right after all, it is possible that the reports are not coming in as they should—which means that some letters need to be written. S.C.M.s should make up two reports for Headquarters. One from all the reports received for *QST* and the other one on the progress of organization from the report every Route Manager sends his S.C.M. on his success in lining up scheduled routes BY RADIO.

The different Section Communications Managers are listed below. Are you doing YOUR part to keep your Section and Division a leader? Do you stand higher or lower than last month and what are you doing about it? How do you expect to stand next month?

If every station owner who reads these words will see that every message he handles is delivered or passed along promptly and report his good work, we will be able to show 100% delivery in the National scheme of things in a short time!

The problem of message RELAYING and DELIVERY must get some serious attention if our general service is to be one of which we are proud. The reports show that messages going over regularly scheduled routes get through with the desired speed and 100% accuracy. The figures show that there is plenty of traffic to be handled. More individual responsibility regarding prompt relaying and delivery will bring the results we want. PLEASE DO YOUR PART, OM.

Messages received should always be *delivered immediately* (a) by telephone, (b) in person, or (c) by mail if no other means of effecting delivery is available.

Never accept messages which cannot be handled or delivered without informing the chap filing the message of the circumstances.

Keep the hook clear by handling traffic on *schedule* daily.

ATLANTIC DIVISION

Section	SCM	%Msgs	%Ors	Orig	Del	Rel	Total
East. Pa.	H. M. Wallace	10.17	4.11	286	218	1501	1995
D. of C.	A. B. Goodall	—	—	—	—	—	—
Md-Del.	H. H. Layton	—	1.42	—	—	—	—
So. N. J.	H. W. Densham	—	1.37	—	—	—	—
W. N. Y.	C. S. Taylor	5.49	4.80	232	101	743	1076
W. Pa.	G. L. Crowley	.34	3.63	9	7	44	60
		16.00	15.33	527	326	2288	3131

CENTRAL DIVISION

Ill	W. E. Schweitzer	3.59	6.12	125	135	434	704
Ind.	D. J. Angus	2.23	1.35	132	135	334	633
Ky.	D. A. Downard	.16	.74	7	4	20	31
Mich.	C. E. Darr	.90	3.20	87	28	36	177
Ohio	H. C. Storck	3.73	6.17	139	83	516	738
Wisc.	C. N. Crapo	5.59	2.58	506	148	422	1076
		17.20	20.16	996	533	1762	3359

DELTA DIVISION

Ark.	Dr. L. M. Hunter	—	—	—	—	—	—
La.	C. A. Freitag	.137	.20	1	7	12	27
Miss.	J. W. Gullet	.317	.21	38	4	20	62
Tenn.	L. K. Rush	.194	.27	—	—	—	38
		.648	.68	39	11	32	127

DAKOTA DIVISION

No. Dak.	F. J. Beck	.05	.93	2	—	2	4
No. Minn.	C. L. Barker	—	1.80	(Included with S. Minn.)			
So. Dak.	G. R. Moir	5.73	1.31	73	40	1031	1126
So. Minn.		2.23	2.30	193	78	174	445
		8.01	6.34	268	118	1207	1575

HUDSON DIVISION

E. N. Y.	Earle Peacox	3.38	2.24	138	40	486	664
N Y C & L I	F. H. Marden	5.26	2.79	397	204	535	1023
No. N. J	A. G. Wester	.69	3.53	28	21	89	136
		9.31	8.56	563	265	1110	1823

MIDWEST DIVISION

Iowa	L. R. Huber	.88	1.07	47	7	120	174
Kans.	F. S. McKeever	.59	1.42	29	31	54	114
Mo.	L. B. Lalmire	2.01	1.92	64	47	281	392
Nebr.	C. B. Diehl	.77	1.37	—	—	—	153
		4.26	5.78	140	85	455	833

NEW ENGLAND DIVISION

Conn.	H. E. Nichols	.91	1.61	26	46	106	178
Maine	Fred Best.	5.79	.75	407	166	562	1135
N. H.	V. W. Hodge	.69	.75	37	22	74	133
E. Mass.	R. S. Briggs	6.00	2.66	337	201	679	1178
W. Mass.	A. H. Carr	.95	2.10	54	32	199	186
R. I.	D. B. Fancher	.59	.81	5	8	52	95
Vt.	C. T. Kerr	.17	.69	22	2	8	32
		16.00	9.36	888	457	1581	2937

NORTHWESTERN DIVISION							
Alaska	L. H. Machin	—	.13	—	—	—	—
Idaho	K. S. Norquest	—	.38 report but no traffic				
Mont.	A. R. Willson	—	.57	17	48	320	382
Ore.	A. C. Dixon	.77	1.07	25	87	41	153
Wash.	Otto Johnson	1.00	2.04	34	30	132	196
		1.77	4.19	59	117	173	349
PACIFIC DIVISION							
Hawaii	K. A. Cantin	2.85	1.16	364	121	102	587
Nevada	C. B. Newcombe	.31	.28	9	5	48	62
So. Sect.	L. E. Smith	11.37	5.95	520	554	1137	2211
Sect. 4	F. J. Quement	1.29	.65	80	39	95	214
Sect. 5	F. J. Lorsheter	—	1.40	—	—	—	—
Sect. 6	St. Clair Adams	—	.16	—	—	—	—
		15.72	9.60	973	719	1382	3074
ROANOKE DIVISION							
No. Car.	R. S. Morris	.751	.64	35	15	92	142
Va.	J. F. Wohlford	.033	1.50	4	—	2	985
W. Va.	C. S. Hoffman	1.14	1.56	47	22	162	230
		1.92	3.70	86	37	256	378
ROCKY MOUNTAIN DIVISION							
Colo.	C. R. Stedman	5.21	1.20	—	—	—	985
Utah-Wyo.	Art Johnson	.08	.96	5	1	10	16
		5.29	2.16	5	1	10	1001
SOUTHEASTERN DIVISION							
Ala.	A. D. Trum	.76	1.96	49	24	75	148
Fla.	W. F. Grogan	1.18	1.52	50	50	117	231
Ga.-S. C., etc.	H. L. Reid	—	1.44	—	—	—	—
		1.94	4.92	99	83	192	379

WEST GULF DIVISION							
No. Tex.	W. B. Forrest	.387	2.41	18	13	45	76
So. Tex.	E. H. Sahm	.249	1.29	22	9	14	145
Okla.	K. M. Ehret	.822	.67	116	15	28	161
		1.45	4.37	158	37	87	282
MARITIME DIVISION							
N. B.	T. B. Lacey	.419	.50	—	—	—	82
Nfld.	Loyal Reid	—	.07	—	—	—	—
N. S.	W. C. Borrett	.066	.18	3	2	6	12
P. E. I.	W. A. Hyndman	.125	.05	10	2	14	26
		.609	.80	13	5	20	120
ONTARIO DIVISION							
Ontario	W. Y. Sloan	.414	1.60	—	—	—	81
QUEBEC DIVISION							
Quebec	Alex Reid	.223	.55	—	—	—	46
VANALTA DIVISION							
Alberta			.19	included in below			
B. C.	A. H. Asmussen	.133	.98	10	2	14	26
PRAIRIE DIVISION							
Man.	F. E. Rutland	—	.22	—	—	—	—
Sask.	E. L. Maynard	—	.51	—	—	—	—
			.73				

TOTALS FOR COUNTRY

Originated	Delivered	Relayed	Total
4,824	2,796	10,569	19,521

DIVISIONAL REPORTS

ATLANTIC DIVISION

EASTERN PENNA.—SCM, H. M. Walleze, 8BQ—The usual gang are on the job. Reports came through in fair shape, but many old ORS's still hold out. New appointments have been made. If you don't have your new one, you don't have any. All old appointments are now QSKed. A very few are on the inactive list. If you are active, you deserve an ORS, but reports simply muust be had in order to carry on. It is not too late to stage a comeback. Get busy, fellows, and get reports in and you will be taken care of if you show the proper spirit. No applications have been received for OBS, O-O, etc. How come?

The 80 meter sluggers hold the lead with over 70% of the traffic. 40 M struggled through with about 20% and those on both bands had 10%. 3ZM is the only one on the 3 bands—but you will have more company, OM. The SCM and a few of the old timers expect to get back on 200 for a little old time stuff—snappy work—rag chewing—CQ—less calling. All those who can put 20 per down with QSZ, are invited to come along. If you are not an old timer, you will get a new thrill—you will anyway!

8CMO gave 8EU a chase this month. 8CDB leaves us to join the Western N. Y. gang for the winter. Sorry, OM. 8BIR reeled a gang out, aided by a new radiating system. 3HD handled Official Sesqui traffic. (Sunday Ball scores? Hi!) 3AIY pumps out Police 'Flyers'. 3ADE is on the job early mornings. 8AVK moved to Montoursville, but kept going. 8CGZ almost made the BPL this month. 3BUV is busy. 3LW continues good DX, but not so much traffic. 3AIG has a new antenna. 3SM was south last month but had a nice total. 3AFQ got a few on 40. 3BIT must be making a good job of rebuilding—he is still at it. 3QY blasted his tubes. 3ZS is home again and ready to bust out. 3VF has bad WX. 3BLP keeps going. Punk tubes gave 8BFE trouble again. A load of work kept 8BQ off the better part of the month. A new 50 watter kept 3BLC off, A bottle went west for 3AWT. 8ZQ is active but leaving for school. A last minute report from 3ZO carries a nice total—and saved his ORS. Hi! Power leaks raised thunder with 8BSZ. 3BVZ is DXing but promises traffic next month. That's better. 8CW 'canned' his YL—again. Moxey of 3BFL keeps skeds wtih another Moxey—3BVZ. Family affair? The op of 8WH says their "vacation" is over. About time, OM.

IF ANY OTHER SECTION HAS A GREATER NUMBER OF BRASS POUNDERS THAN THIS (SEVEN of 'EM) TALK UP. DON'T LET 'EM KID US GANG—KEEP MILES AHEAD!!!

Traffic: 8EU 272, 8CMO 267, 3ZO 172, 8BFE 161, 8BSZ 127, 8CW 122, 8CCQ 115, 3SM 92, 8CGZ 90, 3AWT 36, 3AIG 37, 3BLP 32, 8CZQ 17, 3VF 16, 8CDB 78, 3ADE 73, 8DIR 69, 8AVK 60, 3AUV 52, 8BQ 16, 3AIY 15. 8AJR 13, 3ZM 12, 8WH 12, 3HD 8, 3BVZ 7, 3BFL 7, 3AFQ 6, 3LW 5, 3BUV 4, 3BLC 2.

SOUTHERN NEW JERSEY—SCM, H. W. Densham, 3EH, 140 Washington St., Collingswood, N. J.—3BAY reports that his set is down temporarily for repairs so that little traffic was handled during the past month. 3BWJ handled one. 8BEI reported to HQ. We want news from all stations in this district for these columns. The SCM believes that most of the gang are on vacation and forgot to report. All live stations in Southern New Jersey should send a report for *QST* to the SCM, whose address is given above on the 26th of each month. Send in your traffic report, gang, and let's show the other Sections some active competition. The Section needs some live wires to handle the new ORS appointments and to put out the weekly ARRL broadcast. Applications are welcomed by your SCM.

WESTERN NEW YORK—SCM, C. S. Taylor, 8PJ—Western New York hams have been globe trotting during the Summer. 8AGW has been in Europe operating a Salty ship. 8NT has been touring the West with his father. 8PJ, 8CAN and 8DPL had a wonderful trip on the Destroyer U S. S. King. 8ABG has returned from Milwaukee, Wis. 8AVR is back from his vacation. 8BCP is back with the gang again. BQK has been away from home but is now back on the job. 8CNX will be on strong again having just returned has rebuilt his station. 8CVJ was away and will be going strong soon.

Those working foreigners are 8ADE, who worked Tasmania and Holland. 8AHC worked Australia, France, Mexico and all U. S. Districts. 8BHM worked Australia and WNP. 8BLP keeps schedule with 2CHD, 2APT, 8DGV, 8DHX, and 8FV, 2COH works 70% of stations on UX210. 8BQ works Peru and handled slight traffic. 8CCR works Australian 5LO and NZ 4AM. 8CNT handles traffic via WNP.-1BMS. 8CNX is rebuilding and experimenting with antennas. 8DDL-8MU works a South African station. FB, OM. 8DHX works several stations on a 201A. 8DME keeps schedules with 8AHK and 1ANA. 8DRJ works Europe and Australia every day. 8DSI is rebuilding the set. 8AOB reported for the first time in many moons.

8AKS is building a new mast. 8BCP is using a 250 now on 40 meters. He is on from 11 pm to 1 am. He is also after 10 new subscribers in the ARRL 8BCZ is working hard trying to complete a new radio shack for the fall season. He will be on 40-80 meters. 8BEN has a new 203A and will be hot after traffic. He has been rebuilding and is on 37.6 meters. 8BHM will be on 20, 42.5, 85 and 170 m. after Sept. 1 8BLP has fine success on 76 meters 8CCR is going to change to full wave rectification. 8CNH wants schedules with Northern New York.

8CNX has been rebuilding and is ready for traffic now. 8DHX is expecting 50 watters soon. He states that 8CBM will be going strong as he is a new operator just coming on the circuit. 8DME expects to work higher waves on account of QRM. 8DSI has been rebuilding his receiver. He also put in Kenetron rectification. September promises to be a banner month from reports as the gang are sure busy getting things in shape to make Western New York the prize district in the U S A. While 8PJ was in N. Y. C. for a few hours, 2ZL, 2BRB, 2PF and 2UP made his visit worth while.

SPECIAL NOTICE! 8UL becomes hero. He saved two lives from drowning on his vacation in Canada.

Traffic: 8DHX 507, 8BLP 155, 8BHM 96, 8AOB 61, 8CVJ 51, 8CHH 48, 8AHK 45, 8AHC 23, 8CVP 17, 8DRJ 17, 8DME 14, 8BQK 10, 8CCR 8, 8ADE 7, 8BGN 7, 8ABG 3, 8CNT 3, 8AKS 2, 8HJ 2.

WESTERN PENNA—SCM, G. L. Crossley, 8XE—18 cancellations in this Section in effect Sept. 1 for failure to report to the SCM for three consecutive months with four pending. After a little weeding the SCM believes that we will have a 100% section. The traffic report for the month was very light because of the hot weather and storms causing QRN, but there is outlook for a pickup in the near future. The SCM requests all stations that have made application for ORS previous to this and have heard nothing from it to apply again to him and action will be taken. The records of the SCM are not complete for the time previous to his taking office.

8CRK, 8CLV, 8CIX, 8ON, 8DOQ, 8CUH and 8CMH report off the air due to QRN and heat. 8CKM has been off the air due to serious illness of his wife. We all wish her a speedy recovery, OM. 8BXE is off the air because the BCLs can read his transmission by flicker system of the lights. Hi. 8AGO, 8CUK, 8AYH, 8GI and 8BDJ are off the air due to rebuilding. 8XE is still at the same process of rebuilding. 8CES and 8DHW are now operating with a Hertz, while 8BBL tried a Marconi and went back to the Hertz. 8CTF is changing his antenna system and hopes to make it better. 8GK has put in a kenetron for plate supply. 8AGQ had a hamfest at his house during the month. 8AKI has been experimenting with a Jenkins machine. 8AOS, 8DHN are new stations in the Section this month. 8AIF, 8BGI, 8CTF, 8JW, 8GU, 8VE, 8DCV, 8AXD and 8ABM are helping 8BGI and have been doing their allotment of summer work. 8ABM and 8CWT claim there is plenty of DX but not much traffic. 8CGP is using B battery supply on 80 meters. 8BDJ is having some success using a 201A on 40 and 80 meters. 8ZD has a crystal controlled M. O. in the B band. 8EW is on regular schedule with a crystal controlled on 37.5 meters. 8BGB, 8DOB and 8BVK are on 80 meters on fone. 8BRC and 8BUN are on fone in the A band. 8RC is on 177 meters and would like a few of the hams to call him on fone. 8CEO is using plug-in xmitter coils for band changing. He handled PX on the Florida Hurricane. The SCM with a 3AWH, first operator at 8XE were at the fifth Ohio State ARRL Convention the weekend of Aug. 20-21. That was some convention and imagine a gang of hams (kids 8 yrs. old) turned loose in the amusement park such as Euclid Beach with all the amusements free gratis. Did we have fun. Well guess once—that's all!

Traffic: 8EW 37, 8BBL , 8GK 5, 8AGO 3, 8SF 37, 8AXD 2, 8CES 2, 8BDJ 2.

CENTRAL DIVISION

INDIANA—SCM, D. J. Angus, 9CYQ—9BNP leads the traffic gang, using 203A on 1000 volts, 82 m. 9DPJ, as usual, hands in a bunch of messages. He is now QSR from New Jersey to Hawaii with a 250 watter. 9GX works army schedules exclusively. 9BKJ just put in new antennas for 40 and 80 meters. 9CNC is putting in a 203A and 1000 volt MG set. 9EBW has just been appointed RM in Dist. 3 and is busy getting that district in shape. 9DDZ rebuilt and put in all new equipment. 9CMJ put up a vertical antenna but hasn't worked anyone since. 9AEB is building a new outfit for the winter rush. 9AMI has just finished rebuilding and is going fine on 40. 9DLM is a new station at South Bend. 9EJU is putting in a new 50 watt, 40 meter set. 9TG worked 15 stations after a hilarious time at the picnic of the Indianapolis Radio Club.

9DYT worked 9GX at the Army camp. 9QR changed from 40 to 80 meters. 9BRG's best contact is Marion, Ind., now. 9BDK is off for two weeks moving. 9BK has remodeled for 40 meters. 9DHJ put in 2 210s to work on 40, 80 and 170 meters. 9EJI worked 9GX at Camp Knox. 9CP is off for a month while taking a trip through the west. 9BSK-9DVS-9ZQ gets out all over the world on a 210, 20 meters and 30 watts. 2AU and 9BSK QSO on 5 meters. 9DIJ is getting his 50 perking now. 9ES opened up again at Terre Haute. 9AXO is a new station at Terre Haute trying for an ORS. 9DOD and 9QS are new stations at Rosedale, Ind. 9BDT is going good. 9ABW, 9AVO and 9AIN report traffic and expect to be going good by fall. 9BCM is trying for an ORS and changing from 40 to 80 meters. 9EGE is a new station at Connersville doing good work on 40. 9RS is on 80 meters and getting out good. 9CMQ is still having trouble with the set on 40. Better rub a little butterfly oil on the antenna. 9CYW just blossomed out with a Hertz and good luck. 9EAX just started and is going fine. 9ASJ just got going again with a new shack and pole.

Traffic: 9BNP 160, 9CP 127, 9DPJ 97, 9GX 36, 9BCM 29, 9BKJ 22, 9EJI 22, 9CNC 20, 9CYQ 18, 9EBW 16, 9ASJ 15, 9TJ 15, 9BRG 8, 9QR 8, 9DHJ 8, 9ABW 7, 9EJU 6, 9AXO 5, 9AEB 4, 9CHT 4, 9DSC 4, 9CMJ 2, 9AMI 2.

KENTUCKY—SCM, D. A. Downard, 9ARU—If you fellows want to get your state out of the rut, each of you will have to do his part. Remember—failure to report three consecutive months and—blooey! 9OX means to handle plenty of traffic. He is arranging several schedules and keeping them. 9DTT has a schedule with 9DGY. 9HP is using a Grebe CR 18 and says it's the best yet for the short waves. 9AZF, one of Kentucky's YL's, is attending U of K at Lexington. 9CMW is attending the U. of Texas. 9ALM reports having an enjoyable time at Miami. 9EI, ex ADM of Kentucky, paid the Louisville gang a visit August 29th. After visiting the hams around the Fall Cities he, 9OX, 9BRK and 9ARU dropped in on 9WU to try to locate the reason for his failure to get out. When they left, the BT coupler out of WU's receiver was up on the shelf with the transmitter serving the purpose of RF choke—but the transmitter worked. Didn't stay to see what he was going to use for a receiver.

Traffic: 9MN 11, 9OX 10, 9CMW 4, 9DTT 4, 9HP 2.

OHIO—SCM, H. C. Storck, 8BYN—8BPL heads the traffic total for Ohio. 8BAU, 8GZ, and 8CBI just returned from Camp Perry. 8BYN is at Camp Knox at present. 8CBI is acting SCM for a month and he says not to blame 8BYN for any mistakes in the report. 8BCE has been doing some good DX this month. 8PL is doing good with his crystal control set. Let's all get together next month and bring up the traffic totals for Ohio. 8GZ has been away so not much traffic handled.

Traffic: 8BPL 180, 8DBM 131, 8AEU 50, 8CQU 47, SCWR 37, 8BFO 31, 8BYN 29, 8AZU 27, 8BKM 24, 8VSW 20, 8RY 19, 8GZ 19, 8ANB 16, 8AEK 15, 8RJ 10, 8BNA 8, 8AVX 7, 8ZE 7, 8ADA 7, 8CBI 7, 8BSA 6, 8DSY 6, 8DQZ 5, 8PL 5, 8DIA 5, 8DGT 4, 8WX 4, 8DRX 4, 8DEM 3, 8DND 2, 8CMB 2, 8KC 1.

WISCONSIN—SCM, C. N. Crapo, 9VD—9EK took an enormous jump this month, carrying off all honors in the state. 9DTK comes second, having consistent schedules with 9EK, 9AZN and 9AFF, and handling Army and Tourist traffic. 9AZN deserves third place but we cannot say exactly what his total was as his report is not in. 9DOL, therefore, comes third. 9DLD sends a very interesting report giving the doings of the gang in his district. He entertained 9DLQ and ex 9MH this month. 9BWO says he worked HU FX1 showing that the summer wx is not so bad. 9EMD wants schedules at 6 PM Tues., Thurs. and Sat. PR and Cuba are locals now. 9BJY is using a UX210 on 40 and works them all. 9EAN just got back from Yellowstone. 9AEU says that past operating conditions have been terrible in his section the past month but improving a bit lately. 9BIB is operating on 80 and 150 and still building the CC set for 20 and 40. 9AFZ hasn't changed his antenna in two months. 9EGW has been repairing and is now ready for business. 9VD is still sticking on 80 and busting up the BCLs. 9AGU-9ABM, 9EHM, 9BVA. 9BKR, 9CIU and 9DKA reported but no traffic handled.

Traffic: 9EK 567, 9DTK 206, 9DOL 144, 9DLD 48, 9BWO 29, 9EMD 18, 9VD 15, 9CFT 12, 9BEK 11, 9BJY 8, 9EAN 7, 9AEU 4, 9AFZ 4, 9BIB 3.

MICHIGAN—SCM, C. E. Darr, 8ZZ—8ZT of Pontiac

is back and will use 100 watts. A new M. G. will make it perk. 9EAY has been away but is at his set again. He is putting in a new radiating system. 8DIV will be back soon after a prolonged vacation. 8AMS put up a Hertz Antenna and in four hours worked coast to coast and to the gulf. 8DLD also has been doing good work. 8CEP uses raw AC on account of his S tubes going west. His new Grebe CR 18 pulls in the DX. 8PF says a "sink" is the bunk. ND so he has gone back to chemical rectifier. 8AUB of Grand Rapids is doing nice work on 40 meters. 8BOK is back from an extended vacation. Michigan is a great vacation state—the traffic reports show it, too.

Traffic: 8CCM 88, 8CEP 44, 8AUB 14, 8ZZ 10, 8ZH 8, 8PF 7, 9EAY 6.

ILLINOIS—SCM, W. E. Schweitzer, 9AAW—9PU will be off the air this winter due to the fact that the operator is going to college at the University of Illinois. 9PU and 9AOA will operate a new set there under a new call. Schedules have been kept with 9DWN. FB, OM. 9CSB has rebuilt his transmitter, which now uses 50 watts. A vertical antenna sent the signals to Australia and Sweden. 9AFF has installed a WE 250 watter and is keeping schedules with all the sixth corps Area Army stations. Traffic from Australia was handled. 9BWL has been active and will be appointed an ORS. 9DXZ also has been pounding the key consistently this month. 9CXC is rebuilding. Schedules were kept with 9DWN and 9PU. 9ELR is looking for schedules. Write him. A new Hertz keeps the sigs poking on 20, 40 and 80 meters. 9APY has kept schedules with 8CEK and also 8RY. Army messages for Scotts Field and the Chicago Daily News were handled. 9DAF kept schedules with 9AGG, 8AWQ. 9CYW. 9ALK worked a C and Z. Was away on his vacation most of the month. 9EHK is rebuilding the transmitter for winter traffic. 9BHM insulated the transmitter on plate glass and has added 6 more MFDS to his filter. 9DZR is changing to 40 meters and will be going good by Oct. 1st. 9AXF has been working on a new idea and promises to be on regularly on 80 meters. 9AJM's best DX this month is 7IT. 9DGA reports he finds the 3rd harmonic better than a Hertz antenna. 9AAE will be on the air with 100 watts generator supplied and working on 40 meters with a Hertz Antenna. 9QD reports things slack this month. 9AHD reports bad power QRM so is going into partnership with 9ATP using 10 watts DC. 9DZR reports hearing WNP but he is hard to copy. He will probably use 100 watts on 40 meters this fall. 9BDI reports he will have 50 watts by Xmas. 9CSW is building a new short wave receiver. 9ALW, altho not handling any messages, worked good DX. 9AAW was on consistently with 500 cycle supply after the DC generator and the 60 cycle AC transformer went west. 9DQR tried a Hertz antenna without success. 9BKX just installed a 200 meter fone set and will be on the air soon. 9DDE will be back on the air again the last part of September. 9HW is old 8AAZ, who is back on the air once again with ten watts on 40 meters. Married and living in Chicago, he can still find time to pound the key when he doesn't have to wipe dishes. Hi!

Traffic: 9PU 329, 9CSB 63, 9AFF 56, 9BWL 50, 9DXZ 40, 9CXC 30, 9AAW 30, 9ELR 23, 9APY 20, 9DAE 15, 9ALK 10, 9EHK 9, 9CSL 9, 9BHM 8, 9DZR 5, 9AXF 2, 9AJM 2, 9DQA 1, 9AAE 1, 9QD 1.

DAKOTA DIVISION

NORTHERN AND SOUTHERN MINNESOTA—SCM, C. L. Barker, 9EGU—Since D. C. Wallace, late SCM for the Southern Section of Minnesota, is leaving to locate as 6AM at Long Beach, Calif., the reports from the two sections are as one this month, pending election on a new SCM for Southern Section. It will not be very long now until the SCMs will have their Route Managers appointed, and as a starter it might be well to suggest that we all start to arrange schedules—ones that we will keep without fail, and ones that will be reliable, trustworthy and valuable. Start that now, OM and things will be much easier when the Route Managers start to line things up.

9APF is completing some changes, involving the use of higher power. 9ZT is no more so Don will sign 6AM from now on at 109 W. 3rd St., Long Beach Calif. We certainly are sorry to have him leave us, but wish him the best of luck. 9CKI burned out all his tubes and won't be on until the last part of September. 9CPO is again rebuilding, putting in a 50 watter again, using the REL inductances. 9ASW is changing to the 4 coil Meissner and expects to have much more kick to his sigs. 9EHO is waiting for batteries for his plate supply. 9BMX has been too busy to be on much, and almost forgot the 26th. Hi. 9COS is still waiting for an adjustment on his H tube. 9SF has been very busy arranging schedules. FB. 9BNF has left Minnesota for Washington D. C. to take up a radio course. 9CUM works a large antenna on the 3rd harmonic with excellent results. 9AIR suffered terribly from bad weather conditions the past month. 9EFK uses a glass panel mounted 7.5 watter and is on every noon and evening. 9KV was operator on the USS Baducah for all the cruises. 9DZA uses a Zeppelin antenna with good results and is all set. 9CTW had considerable trouble the past month, but is on regularly. 9DGE is back on the air regularly again, after a short vacation in St Louis. 9CWA steps out well, and works on schedules. 9EGU thought his 2 year old 203A had gone west right, but a severe thumping of the tube against the knee jarred the filament loose from the grid and the tube is as good as ever. (Some filament in that tube). 9DUV is still suffering from fluctuating line voltage but the power company is putting in voltage regulators, which will fix him out FB. 9EEP has the lightning struck guy wire fixed again and pounds out in the usual fashion. 9BAY has a 100 watt set perking now at the Armory and will soon have a 1000 watter knocking out on 40 meters, together with a 50 watt c. w. and phone set on 80 meter band. 9ADS works on schedules and finds it much worth while. 9BPY handled a lot of traffic direct from FX-1 and after rebuilding the chemical rectifier, steps out fine. 9DBW is another who finds 3rd harmonic operation much better than fundamental. He mailed 40 messages to Minnesota points this month. (What's the matter with the Minnesota gang on the air? SCM). 9BIY holds first place in the state for traffic this month, but is leaving for school at Ames, Iowa.

Traffic: 9BIY 163, 9DBW 70, 9EGU 47, 9BPY 28, 9ADS 20, 9BAY 16, 9EEP 14, 9DUV 12, 9CWA 10, 9DGE 10, 9CTW 8, 9DZA 6, 9KV 6, 9EFK 5, 9AIR 2, 9CUM 2, 9BNF 2. 9CCX 1.

Addendum: 9DEQ has rebuilt his transmitter using new REL inductances and "Zep" antenna. 9DHP just got on the air and hasn't worked any DX yet. 9DMA worked M-9A and WNP. 9BKX is off for alterations. 9EGG reported that 9BNF has gone to Washington to take up commercial operating, and his brother will take charge during his absence. 9EFD is contemplating rebuilding. 9ADF is now trying Vertical Antenna using self-rectifying set with 2 50 watters.

Traffic: 9DEQ 3, 9DMA 4, 9BKX 4, 9EGG 3, 9EFD 2, 9ADF 8.

SOUTH DAKOTA—SCM, F. J. Beck, 9 BDW—Stations are general rebuilding in preparation for cooler weather. 9DWN is high traffic man by virtue of 13 schedules and 8 hours per day operation. He operates on both 39 and 80 meters. 9DZI broke into Australia in addition to a fine message total. 9CJS has rebuilt his set and has 100 watts on 80 and 160 and 15 watts on 20 and 40 meters. 9DIY has an M. O. set. 9DNS the Y. M. C. A. station at Sioux Falls is active 9CKF is a new station at Philip and 9CNK at Clark. 9DB has a Hertz which works FB. 9TI and 9DID are rebuilding sets. 9BBF is the Official Observer.

Traffic: 9DWN 888, DZI 174, 9CJJS 44, 9DB 20, 9BDW 20.

NORTH DAKOTA—8BJV has raised his wave to 42 meters and has enlarged his rectifier and expects to have better QSB. He is building a seven and one half watt fone set for local use. 9BZF will be back on the air again in a short time and expects to be able to handle some traffic for North Dakota. 9DBR is doing good work again and will be on nearly every night. 9CRB will be on 178 meters all winter. His folks have gone and he has to take care of the telephone central so not much time for set but managed to keep schedules with his folks while away on their trip. 9DKG has been heard on west coast in day time with 50 watt input. Horizontal antenna system, 8 feet high. 9FN is moving to another part of town and will be off the air for a few days but expects to be on with a better set then.

Traffic: 9DKQ 2, 9EFN 2.

DELTA DIVISION

LOUISIANA—SCM, C. A. Freitag, 5UK—There has not been very much activity in this section due to the exceedingly poor weather conditions and heavy QRN. I believe, however, that we can look for quite an improvement within a short time, as even within the last few days foreign stations seem to be coming in a little better.

5KC reports having a schedule with the Motor Ship City of San Francisco, RXY. each morning at 3.00 A M. He has just purchased a new motor generator and is using two UX210 tubes with an input of 230 to 250 watts.

5WY states that he has not been able to do much as he is rebuilding his transmitter and receiver. He has a KFUH transmitter of 50 watts power. 5ML also uses the same circuit with CX-210s.

The Shreveport gang has formed the Caddo club and report it progressing nicely.

Traffic: 5UK 12, 5KC 8, 5UK 7.

MISSISSIPPI—SCM, J. W. Gullett, 5AKP—5QZ has just returned from a Naval Reserve Cruise to Havana, Cuba and will be on the air regularly from now on. Ben. W. Robins, of 5YD has been pounding brass as a commercial operator and has just returned from a trip to South America. 5AGM will be off the air until next summer as Boy Scout camp has closed for this season. 5ALZ-5ARB are on a trip to North Carolina. The SCM has three applications for ORS from good traffic handlers.

We hope to have a much better report next month as most of the amateurs in this section are rebuilding their receivers and transmitters for the cold weather that is to be here soon.

Traffic: 5AKP 29, 5API 27, 5AQU 5, 5AGM 1.

TENNESSEE—SCM, L. K. Rush, 4KM—Come on, you ORS, and send in those reports each month. We want more ORS in Tenn. and especially around the Eastern portion of the State. 4HL uses a WE250 and is leaving for a visit to u6CBM. He has applied for ORS. 4FA has handled traffic for 9EK and has been an active station through the summer. 4EO goes to Armour's Institute and will have a 9 call while in Chicago. 4CU is rebuilding and will knock them cold, soon. 4IV has come to life again and is heard on 40 meters. 4KM is slowly but surely getting on the air again. Several of the gang from Memphis came over for a few days.

Traffic: 4FA 17, 4HL 11, 4KM 10.

HUDSON DIVISION

EASTERN NEW YORK—SCM, Earle Peacox, 2ADH—Say! Not bad for a start, eh? This Section led the Division last month. You fellows that spend all night on 40 meters calling twenty-five Zedders and working three of them must think you're having a wonderful time. DX stations are just like women—the same the world over. Allentown, Pa., or Melbourne, Aust., they all hand you the same line. It's about time we got wise to this. Come up on 80 meters where you raise them all. Arrange a few schedules and shovel a few messages around, and we'll guarantee you a brand new thrill. What, say?

2QU, 2BOW, 2ADQ and 2ASE want ORS appointments while 2PV, 2CNS, 2DD, 2AGQ, 2AAN, 2LA, 2AAZ, 2CTF, 2APT, 2AKH, 2ANV, 2AML, 2CTH, 2CYM, 2CYH and 2ADH have had their appointments OK'd and new certificates reassigned. The others, with the exception of 2BQB and 2AGM, who have asked to have their ORS suspended due to inactivity, will have some tall explaining to do or they'll be canned with a capital "C".

2APT is now working on schedules with 8BLO, 1UE, 3AWT, 2AKH and 1ANE. He hit his daily dozen for three weeks and look what happened. 2ADH ran second but was off to rebuild. Made a chemical rectifier and every plate glows! 2CDH nearly made the BPL and kept a daily schedule with 8BLP but is selling out. 2AKH nearly made the BPL and says traffic is plentiful. 2AWQ insists on sending his reports here instead of to Mardon, so we hereby acknowledge them anyhow. 2AGQ took a 215 word PX msg. from VOQ but admits dropping two words. If you have heard VOQ, you must wonder how he did it. Skeds were kept with 2ALI and 2QU. 2AAZ has a daily sked with 8CJJ and clicked with WAP to boot. 2AML is nursing a Hertz antenna in his spare time. Hi! 2ANV is the live wire from up-state. He keeps the SCM posted on what's what. Thanks, OM. He had a sked with 2QU. 2LA is on 180 meters and says the wx is fine up there. Quite a few 2's on the old band, he says. FB. 2CTH worked nOWC, f8JN, g2IT, g6TD and heard from 8MA and a7CW on 40 and bB2 on 20, all in daylight. Hw? 2CYM may QSY back to 200 meters. Who said it was NG? 2ADQ says "Puedo tenor ORS certificate?" To which I answer, "Si Si, Senor!" By the time you read this, 2CYH will be on with xtal control. FB. It's tough 2DD can't find more time to whack the key. There's one station that would sure boost our traffic total sky high. "DX?" says Bill, "Hi Hi" says me. 2PV is another married ham but seems to find plenty of time to rebuild and everything. Just back from his vacation, watch Herb roll up a total. 2BOW is just back from Plattesburg and is trying hard to get started again. The SCM is afraid it's those wild women from Tarrytown. 2CTF went to all the trouble to put a big jug on 20 meters just to work VO^ on schedule but never a tumble did he get. And after building the low power set VOQ is using, too. 2CNS, on vacation, couldn't do without a portable receiver, but oh, how his fingers itch for a key! 2AAN pulls the same line he had last month, the lightning struck his fifty blue. Hi! The SCM feels that 2CJE and 2AQH are tempting him with their tale of adventures with the YLs. 2ADD ran around the club with old 2CUZ. Wilson is going to Princeton and will have to give up his prep call 3WV, but Whittemore is going to open up again for a few hectic months of ether blasting and then—well, he's going to join the Ancient Order of Benedicts, you know. 2CBG has already married but is having a hard time finding a QRA that will do for the wife and a station at the same time. And 2AJE, well, he's still going to open up with two "P" tubes and 500 cycles on the plates. Hi! 2BQB is going to school in the first district and will have a station there. 2UF is a new one in Delkirk and a brakeman on the Central in his odd moments. 2AWF had the great misfortune to lose his father, which may account for the silence in Albany. The boys all extend their sympathy. 2ANV will open up when the auto season closes. "You can't be on the road and on the air at the same time," he says. 2TO is a new one in Catskill, ex 1PB, too. 2CVH is going in W. P. with two fivers. Spring Valley also has a new one, 2AUO on 40. 2TF dropped in to the Yonkers Radio Club. Lots of new hams, eh? Leave it to us to pass out the report cards. Hi! 2ANM says he just got back from vacation, which accounts for the silence up yonder.

Traffic: 2APT 250, 2ADH 160, 2CDH 91, 2AKH 78, 2AWQ 24, 2AGQ 19, 2AAZ 13, 2AML 9, 2ANV 8, 2LA 4, 2CTH 4, 2CYM 2, 2ADQ 2.

NEW YORK CITY & LONG ISLAND—SCM, F. H. Mardon, 2CWR, Brooklyn—2PF has a new antenna up, 85 feet high. FB. He is pretty busy with the Army net control work. The following stations have been appointed. Bronx 2CYX, Alternate 2APV, Brooklyn and Staten Island 2PF, Alt., 2CLA. Manhattan, 2EV, Alt. 2 ABT. Long Island 2AKV, Alt. 2KG. 2CRB has a total of 27 foreign countries. He needs Asia for a WAC ticket. 2BRB has been away most of the summer but is back now and intends to get going. 2BBW blew 2 kenetrons and installed four in their place. 2BO now uses tuned plate and grid and reports the set perking FB. 2AQW is still kicking out FB as usual. 2APD just got back from vacation and has a new receiver. 2WC is away on a much-needed vacation. Director Dunn, 2CLA, is also on vacation. Both will be back soon and will start their many activities.

Bronx—2SF is still much alive but nil on traffic just now due to other activities. 2CYX reports DX FB. He has handled traffic with WNP and kept schedules with NTT in Greece, Turkey and Roumania. also nOWC. Take a look at his traffic total for this month. 2BBX now uses break-in system. He recently worked CVNXL. 2AYD now uses the call 2ABG in addition to his other one. 2APV is still batting them out, he is handling Porto Rican traffic regularly, recently worked Tasmania and keeps skeds with NTT and a7DX. 2AHG is on his way to Calif. to KDNR. 2ALP is working his station during his absence. He has worked quite a few foreigners but the poor tube gave up the ghost. Hi.

Manhattan—2NZ is building a 204A set so hasn't been on the air much this month. Some one pulled his antenna out of the pulley and he just got it back. Nice people where he lives. 2LM is working a few foreigners but says traffic is not so good. 2LD has the hard luck to have to work at night, so he doesn't do the DX some of the fellows do. 2EV recently took a 172 msg. from z1AO solid. It contained 1ARU news. He says it came in fine. 2BNL just came back in the flivver from a trip to the Midwest. He saw all the gang out there. He is now using 400 V. B. battery and a 8 v. A battery on a UX210. 2BCB is doing the same thing, only using 500 v. 2APJ is using an H tube

and a new antenna 135 feet above ground. 2AMJ has been very busy lately. He says he had a great time with 41Z on his recent visit to N. Y. 2ALS is using 2, 210s and a crystal on 80 and a 50 on 40. 2ALL uses tuned plate and grid.

Queens—2AIZ is rebuilding, putting in a 50. He will be on the air in Sept. 2AYJ has started at last but says he wishes he had started long ago. 2AWX back on the air after a hurried trip to Washington. 2AVB is busy taking orders over the air from DX hams for radio goods in N. Y. stores. 2AUE is doing good work. 2AJE finally got across the pond, worked f8YOR. 2AEV is very busy with the YLS. Hi! 2ABF is getting out FB.

Richmond—2CEP is the star of S. I. this month. 2AKK is back from a flivver trip through Texas and Colorado. He will be on the air steady now. 2AKR is rebuilding. He will be on in Sept. 2ATQ has increased his power and is ready for traffic. 2ABO, 2ABH, 2ABD are new stations in S. I. 2TS and 2SL are on 40 meters. 2AFV has a fifty going on 40, 80 and 200 m.

The SCM has had many requests regarding new ORS certificates and applications for same. Be patient and they will all come in due time, and if you don't hear from me immediately, don't think I have forgotten. I have so many other things to straighten out that it is impossible to get down to the ORS at once. Your old certificates are still in force until I start to issue new ones, which will not be for about a month and a half yet.

Traffic: Richmond—2CEP 207, 2AFV 26, 2AKK 10, 2ATQ 10. Queens—2AVB 102, 2AUE 76, 2AEV 41, 2ABF 25, 2AYJ 20, 2AWX 18, 2AJE 17. Manhattan—2APJ 54, 2EV 38, 2BCB 25, 2ALS 15, 2AMJ 11, 2NZ 10, 2ALL 9, 2LD 6, 2LM 2. Bronx—2CYX 211, 2BRX 34, 2APV 33, 2ALP 26, 2AHG 20. Brooklyn—2CRB 35, 2PF 19, 2BO 18, 2AQW 17, 2APD 1.

NORTHERN NEW JERSEY—SCM, A. G. Wester, 2WR—2AT promises to break forth with greater power. 2 BW is QRV experiments and vacations. 2CP expects to be an Army Station shortly. 2CW transmits with an indoor antenna. 2AFQ is having trouble having the station license renewed. 2DX is back from Bermuda and has worked I-1AY. 2EY is still rebuilding for short waves. 2FC is keeping the shore traffic route working. 2GV is busy laying plans for an amateur banquet to be held in Newark Oct. 16. 2AXP is a new station opening in Hasbrouck Heights. 2IS has reopened and reports very little traffic. 2KA is rebuilding the receiver for better DX. 2QI is a live wire station in Union City and is in line for an ORS. 2QS is trying to get the Plainfield amateurs together again. 2ADU has just completed a new 55' mast. 2ADV had the misfortune of blowing two fifty watters. 2AHK is leaving for college and the station is now dismantled. 2ALM had to build a chemical rectifier after his Kenotrons went up in smoke. 2ALW also had a misfortune which was blowing his motor generator. 2AMB has all prospects of having the best amateur semi-commercial station in the East. 2 ANB would like to arrange schedules with the gang. 2AUJ has a baby girl which he hopes to train for a 2nd op. 2AZU is in Washington visiting the hams. 2BK of old spark fame is threatening to return with a tube transmitter. 2ARC is vacationing in England but the station is in steady operation with a second op. 2AUH will have a fifty and two-fifty watt xmitters for all amateur waves. 2AUI is on a cruise with the Naval Reserve. 2BGI is working up in the 200 meter band. 2CDR is operating on the 40 and 200 meter bands. 2CGK reports very good success on 20 meters. 2CQZ is attending Columbia University in the radio course under Prof. Morecroft. 2CYV is rebuilding for all the amateur bands. 2WR will be silent and he enters the fifth amateur stage Sept. 25.

Traffic: 2AT 23, 2GV 13, 2AHK 13, 2ALM 13, 2CP 12, 2AUI 12, 2QI 11, 2DX 11, 2CYV 6, 2IS 5, 2QS 4, 2ADU 4, 2CQZ 4, 2KA 2, 2CW 1, 2ADV 1, 2ARC 1.

MIDWEST DIVISION

IOWA—SCM, L.R. Huber, 9DOA—The SCM put in a month's work as a CMTC student and returned to find that 9BKV and 9CZC, as Route Managers had been hitting the ball in fine shape. FB! Iowa will be all there this winter when it comes to traffic work.

More applications for ORS appointments are solicited. You may not make the grade at first—but you can find your weak spots and shoot again three months later. Several applications have been received to date.

9BFF takes the cake this time with a big stack of messages leaning toward the BPL. Yes, SCHEDULES DID IT. 9CGY and 9EFS continue their good work. 9CZC (AST. R. M.) is eavesdropping on 80 with an ear for reliable Relay Stations for the routes this winter. 9DSL pounds off a few in spite of being in the hospital. 9AXD came to life and hooked some, too. General development all over the state indicates that all hands will be on deck this winter for traffic. 9DOA will attend the S. U. I. at Iowa City this winter. Look for a change in address in next QST. Until then, send all mail to Tipton and it will be forwarded. And don't be afraid to write letters.

Traffic: 9BPF 74, 9CGY 30, 9EFS 22, 9AXD 16, 9DSL 12, 9CS 6, 9BOS 6, 9CZC 5, 9AED 3.

KANSAS—SCM, F. S. McKeever, 9DNG—Kansas had an unusually poor month for traffic due to the reporting of so few stations. The Topeka gang are going strong with four new ORS: 9CET, 9AEK, 9CV and 9BHR. 9CET is a new OBS also, with a new 204A and worked A, Z, FM, CH, G, GH and BZ. 9CV and 9AEK have 50's and work A, CH and Z often. 9DPU, 9CVL, 9CKU are on some and report a little traffic. 9DNG worked all continents and a new country—Morocco. He and 9AEK report QSO with WNP and KGBB. 9LN worked A and Z as well as WNP. He is on from 4 to 6 hours a day and is coming strong. 9BGX and 9KM promises to be on with a punch in Sept.

Traffic: 9CET 26, 9CVL 22, 9DNG 17, 9LN 16, 9AEK 12, 9CV 8, 9CKU 6, 9DPU 6, 9BHR 1.

NEBRASKA—SCM, C. B. Diehl, 9BYG—General affairs are slowly picking up on account of cooler weather coming on. 9DXY is rebuilding and will be on about Sept. 15 for the rest of the winter. 9CJT has been on vacation a good deal this summer so no antics. 9AKS is in a summer army training camp. 9AWS is QRW army work. 9BN is still at it. 9EHW is arranging schedules for winter traffic. 9BFG is on vacation in Northern Minnesota. 9BOQ says QRM is bad. 9EAK is still rebuilding and getting ready for a spasm this winter. 9BXT says traffic is light this summer. 9CGQ is still at KMMJ. 9DUO is getting ready to do lots of business this winter. 9DUH is pounding away as per usual. 9BBS is QRW with his railroad and doesn't have time to be on very much. 9AGD is working hard to get on the air soon. 9EEW is back at it again. 9EBL is doing the same good work. 9BYG is standing by.

Recent appointments: 9EW, is Chief Official Observer and has appointed 9EEW as first assistant. 9BFG is Chief Route Manager for this section. It is indeed a great pleasure to have him accept as he is the best traffic man in this Section and we are expecting great results from him. 9BQR has been appointed ORS and asks that we slip him business. 9EBL has been appointed Asst to Route Manager and acts until 9BFG gets back.

Chatter: Quinby is QRW with his work and says he will be still more so when he breaks out on 80 meters for winter traffic. Neilson is experimenting. Badgerow says he hasn't feet and hands enough to keep up with the game. Anderson is handling traffic as per usual. 9EHW came back to life and is QRV for traffic from all four sides. Burwell is tinkering with a crystal. Magnuson is looking for schedules for this winter's work. 9EAK is rebuilding. 9DUH is sure showing himself this summer and is doing some very fine work. 9BBS hasn't much time for radio now as his work keeps him away most of the time. 9AGD paid us a visit Aug. 23 and looked for a few pointers for his new transmitter. 9EEW sure does pound them out and is very chesty over a new wavemeter. 9EBL claims he has the worst location in the state but his reports deny that. 9YAB is at it again and inquires about an ORS. 9ACF and 9FA are mainstays there now and we expect great results this winter. 9BQR just got his set to "SNORT" on 40.

Traffic: 9EEW 49, 9EBL 39, 9DUH 16, 9BNU 14, 9DXY 12, 9BBS 11, 9CTJ 8, 9BXT 2,.

MISSOURI—SCM, L. B. Laizure, 9RR—A general get-together and hamfest for hams, as far away as they can find means to come from (hi), was staged Sept. 4-5-6 at St Louis conducted by the OBP. There was a generous attendance of hams from all over the state. Details next month after we recover. 9ZK-AAU made the BPL this month with a grand revival of mag. activity. 9BHI and 9BEQ

just returned from a western tour so traffic has been nil. 9DMJ passed along a few mesgs and reports a battle with a super-sink—not of the Taurenweref kind. 9DLD says ND, too hot.

9DAE is appointed as State RM. 9CKS came home from Harvard, built a big antenna, got set to working on harmonic and has been worked several times and several hundred words traffic handled. QRD Can. Govt., Ottawa, also msgs, for members of the crew to home folks, VYG reporting him R7 to R9. The fly in the pudding is that CKS has to return to Harvard and his side kick 9CYK is QRD Northwestern. 9DKG is QRT, has to stay home as father had an operation. 9ARA made BPL, also working all Aust. districts, NZ, Alaska and others on 20 meters and wants schedules on 20. 9CDF working W. U. trick and QRT temporarily. 9DVF tells this: No antenna, no counterpoise, moved set to basement, blew 201As with 90 on the filament, shot rectifier, delivered 3 msgs and is still a ham. 9BQS reports reopening Sept. 1st. 9CWZ is away traveling somewhere west. 9DAE is returning to school in Warrensburg, address 205 E. Culton. He is reopening his station there and wants to hear from ORS in regard to route problems. 9BSV put in new Hertz antenna. He says it is FB and wants schedules north and west. 9BUL is wrangling an H tube. Ex-9EKP is reopening his station with low power. 9BUE handled traffic and kept schedules with 5ACE at 7 am daily. 9AOB is shut down on account of heat and QRN. 9CRM reports same at his station.

9BSH reports all hands QRT for summer. 9BOB ditto. 9DWK is using 500 cycle plate supply as the rectifier went dead. 9BIE reports ND locally.

9CAX is back on 40 handling traffic. 9BND's last three monthly reports arrived via the Director. 9ADR handled a few messages. 9ELT is going again. 9RR and 9ACA are too QRW to operate lately.

Traffic: 9AAU 104, 9ARA 103, 9BND 75, 9CKS 48, 9EEZ 12, 9ADR 10, 9DMJ 10, 9ACX 9, 9BUE 8, 9DVF 3, 9RR 3.

NEW ENGLAND DIVISION

RHODE ISLAND—SCM, D. B. Fancher, 1BVB—Providence—1AID is on again after an illness and is ready for schedules. 1AWE, 1BIE 1AEI and 1AAU are all active and live wire stations getting out well. 1AWE worked Jugo Slavia. FB, OM. 1AHE and 1DP say that vacations interfered this month. Hi!

Westerly—1AAP has been appointed an Official Observer and has logged a bunch off wave. Look out, OMs. Things about the same at 1BVB. 1BLW is a new ORS using a low power set and is getting out good. He is an ex-commercial op from the United Fruit Co. so don't try to burn him up. It just can't be done.

Newport—1BQD is a new OBS. The SCM visited him and found a neat station. He also found that he has a peach of a new OW. Hi!

Traffic: 1AWE 20, 1BVB 14, 1AAP 12, 1AEI 7, 1AAU 6, 1AID 4, 1BIE 2.

EASTERN MASS.—SCM, R. S. Briggs, 1BVL,—1BMS, 1UV, 1BVK, 1ABA and 1QZ join the Brass Pounders' League. FB and many congratulations. 1AGS is on again with a 50 watter and expects to handle traffic on 200 meters. 1CJR has been away but handled some traffic. 1RR built a crystal control transmitter but it did not oscillate within the ham bands. 1AXA visited 2CVJ. 1ABA is one of our traffic wonders but he dropped a screwdriver on his set and had to use one tube for both sending and receiving. 1OU bought a lot of junked Army and Navy sets and used the good parts. 1AIR reports QRN very bad at Nantucket. 1BVL had his crystal set going fine until the cyrstal cracked. 1JL went away on a USNRF cruise. 1BZQ is trying to get on 40 meters at his new QRA. 1NK and 1ADG are putting Revere on the map. 1RF is home again. 1BKV handled a bunch of traffic on 80 meters. 1UE and 1BMS do some snappy traffic work on 42 meters early every evening. 1ACI rebuilt his set and then was sorry he did. 1NV is on with a 50 watter. 1BAT is still trying to get some rectifier tubes. Keep it up, OM. Hi! 1KY is back after being on at 1CPD. 1LM was bothered by bad power leaks. 1CIT is going to operate on 80 meters. 1AHV did some fine traffic work at his summer QRA using the call 1QZ. 1AVF had to drop schedules due to hot weather. 1AWB visited the gang in Mansfield and Pawtucket. 1ALP is on again after QRM from Fords and YLs. 1ADM handled a message with WNP that was QSRd from F-8TBY to Chicago in 1 1-2 hours. 1GA is getting out fine with a master oscillator set.

Traffic: 1BMS 304, 1UE 270. 1BKV 114, 1ABA 110, 1QZ 105, 1BZQ 55, 1AVF 33, 1NK 28, 1AGD 21, 1GA 20, 1AWB 20, 1ACI 19, 1BVL 15, 1ADM 11, 1NV 8, 1CJR 8, 1OU 7, 1ALP 6, 1JL 6, 1AIR 5, 1KY 4, 1LM 4, 1AXA 3, 1AGS 2.

MAINE—SCM, F. Best, 1BIG—1AUF handled an impressive total, closely followed by 1ATV and 1BFZ. 1BCY is working on both 40 and 80 meter bands with a wonderful DC note and a nice punch. This station has now been in operation for three summers. 1UU is on almost every evening and doesn't intend that anyone else shall get the Queen City Radio Club cup if he can help it. 1AYJ has been busy but in spite of this, has managed to tie up with NGT, Naval Radio Station, Seattle, Washington on 80 meters. 1BNL is still handling a little traffic in spite of the fact that he only gets home over the week-end. 1ADI has been on intermittently and promises to handle some regular schedules this fall. 1QY is going great guns with a new Hertzian antenna. 1COM and 1BEE have started up and give great promise of developing into a good pair of traffic handlers. 1BHR has a fifty and is punching great holes in the ether. 1BIG has a new transmitter under way for the 80 meter band. 1BDB reported with a good total. 1AIT reported through 1BIG via radio.

Traffic: 1BIG 531, 1AUF 157, 1ATV 132, 1BFZ 117, 1AYB 59, 1BDB 27, 1UU 18, 1AYJ 14, 1BCY 13, 1BNL 9, ADI 7, 1QY 7, 1COM 4, 1AIT 40.

VERMONT—SCM, C. T. Kerr, 1AJG—1BBJ hops off with the traffic honors. FB, OM! 1BEB is greasing up again and will soon hit the them off. 1BD, a new ORS, is shooting in the traffic too. Last month he handled 43 messages with his "fiver," leading the state! 1CQM is on a trip south to see the sights. 1AJG is on his vacation. 1AC is rebuilding. Where is 1BDX? 1BIQ is now QSO Canada. Hi! Now, fellows, with the advent of cooler weather, the SCM expects all to get in line again and slam out those msgs as well as report activities to him.

Traffic: 1BBJ 23, 1BD 9.

CONNETICUT, SCM, H. E. Nichols, 1BM—The SCM is looking for a wonderful Fall in the radio work of this Section and has received quite a few applications for ORS appointments which indicates our stations are doing good missionary work. Fellows, do all you can to encourage that new amateur in getting started for we must keep the rank filled up. 1BEZ, a new ORS, and 1AOX head the list for the most traffic handled and are to be congratulated for their zeal during the warm weather. 1FD is sick in bed but sent in his report just the same. We certainly appreciate your loyalty, OM, and hope you will recover very soon. 1MY has a portable 50 watter at his summer home and is QSO France. 1VY is working out a crystal control transmitter and hopes to have it working on 40 meters soon. 1BHM, Route Manager of New Haven County, has lined up a number of fine prospects for ORS and expects to have his territory thoroughly covered and working by Fall. 1BM has at last succeeded in getting on the air and hopes to be QSO with all Conn. ORS. Keep watch on 40 meters.

Traffic: 1BEZ 36, 1AOX 30, 1ADW 24, 1AOS 16, 1MY 14, 1FY 14, 1ZI 13, 1HJ 9, 1BGC 6, 1BQH 5, 1BM 4, 1BHM 4, 1IV 2, 1BLF 1.

NEW HAMPSHIRE—SCM, V. W. Hodge, 1ATJ—Traffic has increased somewhat this month in spite of bad QRN and QRM from vacations. Most of the gang are on 40 meters and report good DX. A bunch of ORS are to be cancelled for failure to report for two consecutive months. 1AER reports bum receiving conditions. 1AOH has been doing good work and is a prospect for an ORS. 1BFT was QSO WNP and took 7 messages. He also worked f8-RBT twice. FB, OM. 1OC will be on 80 after Oct. 1 and wants schedules. 1AVL also worked WNP and is having great luck on 38 meters. He expects to return to N. H. U. this fall, a new 50 watter is perking at 1AOQ

Traffic: 1AVL 30, 1AOH 30, 1AER 28, 1AOQ 20, 1BFT 10, 1CKK 10, 1ATJ 5.

WESTERN MASSACHUSETTS—SCM, A. H. Carr, 1DB—Most of the gang reported. It was surprising that a few of the old timers forgot. We had quite a few zeros due to hot weather and vacations. Dr. Tesmer of Shrewsbury, a staunch friend of the Worcester County hams, has joined the ranks of

ORS. We all wish him good luck. His call is 1UM. Our old friend, 1AAC is on the air with a bootleg 201A and Ford coil until fall when I suppose he will QSO Mars with a new set. 1AAL is setting up a Master Oscillator and Power Amplifier. AJM new ORS. 1AKZ is still handling messages with handled some traffic for WNP which was FB for a the schooner Sachem, III. Good work, OM! 1AMZ is on schedule with 2ARM daily. 1AOF has been QSO Tasmania. He has 500 watts on CW and fone and somebody surely will hear him now. Hi. 1APL is using 250 volts B battery and will soon have 500. Our old friend, 1AQM has come back strong, broken leg and all. He reached a total of 31 which was pretty good for a cripple. Perhaps it would be well if some of the rest of us got "broke" somewhere? OM Cushing, 1AAW, says he is still fishing, swimming and studying. That must be hard work compared to being DM. 1BSJ is rebuilding and says he will be with us in the late fall. We sincerely hope so. 1AZW says that he, 1AMZ and 1AMS had a great time on their visit to Hartford. I believe they visited WTIC and didn't suggest any improvements to the management. Can it be that some of us amateurs are slipping? Hi. 1AJK sticks to 80 meters and says no YLs at present. No kiddin? 8RY and 2ATK visited 1AMS during the past month. We would like to welcome more visitors to our section to show them what a live bunch we are and how it can be done. Your SCM quite unintentionally forgot to thank you all for his new job in his last report. This may be the only way that some of you will hear of it and the SCM wants to take this opportunity to thank you for the support and ask your co-operation in putting the Section at the very top. Visitors are welcome every day at 1DB. I hope to get all the new certificates out soon. 73.

Traffic: 1AJM 49, 1AMZ 46, 1AQM 31, 1AKZ 21, 1APL 12, 1BIV 8, 1AMS 6, 1AJK 4, 1AAC 2, 1AAL 2, 1BVR 2, 1AOF 2, 1PY 1.

NORTHWESTERN DIVISION

OREGON—SCM, A. C. Dixon, Jr., 7IT—Portland stations led the rest of the state as usual. There are now five Portland stations which are on the air consistently, working DX and handling traffic. They are 7AEK, 7IT, 7VH, 7AV and 7WU.

7AEK has been keeping schedules with Alaskan 7KK for the last three or four months and has handled around sixty messages per month. 7VH is chiefly an experimental and DX station. He has kept schedules with Borneo and Malay. 7IT has worked the eastern hemisphere a number of times and cleared 1800 words of traffic through x2XA. 7AV makes up by consistency with what he lacks in power. His best DX is Japan. 7WU has been reported in France and Italy. 7AKK is back from his honeymoon and promises to send in a creditable report next month. He is one of the old timers. He did some good work this month, too. 7SY got on for five days and handled several messages. 7AAC is a newcomer in line for an ORS ticket.

Portland and the rest of Oregon for that matter is poorly situated for transmission east. The sixes are much louder in the east than any of us. The gang back there must not think that we do not know how to operate because we make up for it West. 7VH, 7WU and 7IT are reported in Malay, Borneo, Japan, PI and China as being louder than any of the sixes in many cases. There is not a 250 watter operating in Oregon that I know of, either. We do it on fifty watters.

Traffic: 7AEK 64, 7VH 29, 7IT 26, 7AV 12, 7WU 10, 7AKK 8, 7SY 4.

IDAHO—SCM, K. S. Norquest, ex-7OB—7FT is still on the East coast pounding commercial brass but will be back to go to school this winter. 7YA is getting lined up with higher power but will not have a staff of operators till school starts. 7OB and 7RQ are no more, as their calls have expired and they are attending college. They still retain their operator's tickets and pound the brass whenever the occasion affords. 7VU will be active in Boise this winter with his two 250 watters. 7QC is on again and reports good work on the early morning trick. 7JF is the star relay station this month before two line surges cleaned out his supply of tubes.

WASHINGTON—SCM, Otto Johnson, 7FD—Somewhat better results were obtained from the ORS this month but many of the reports came thru late. Don't forget, two "misses" and you lose your ORS. All stations report good DX throughout the summer. Some fellows are too QRW with the YLs to take advantage of it, tho. There's only one cure, fellows! 7UO, a non-ORS, takes traffic honors. Yes, he keeps schedules! 7GE worked O-4AE. 7RL worked O-A3Z and Borneo SK2. FB. 7VL says that Spokane hams are installing a 250 at the Inter-State fair. 7AIM got QSO VOQ. 7UQ and 7KU are back. 7FD is installing a mercury arc rectifier, as is 7AIM. 7NH reports better DX with DC. 7AG shot his fifty, shook the filament together again and worked A, Z, AU, Hu's and much local DX. Tube must be in its second childhood. 7CY did not get much traffic. 7GB is QRW YLs. (Or is it a YL??) 7EK and 7TX are still vacationing. 7AFO has schedules with au7BW, ex7AFN. 7BJ says QRW very, no brass pounding. Ex 7OT writes that he will sign 9HASH or something from Chicago. 7PZ is having tube trouble. 7QP, of Key Klicks, has moved back to Wallace, Idaho.

Traffic: 7UO 84, 7RL 44, 7AG 22, 7VL 15, 7NH 8, 7KU 8, 7AIM 6, 7FD 4, 7GB 3, 7CY 2.

MONTANA—SCM, A. R. Willson, 7NT—7PU and 7DD did some excellent work this month. 7PU joins the BPL. He has a new 50 watter working the whole world. Five rush messages from WNP to Chicago.

7DD is doing excellent work in spite of his poor location. He has worked A, Z and BZ, on 40 meters, using M. O. circuit.

7AAT is one of the new Red Lodge stations. 7AAE is operating a power station at Mystic Lake but will be back with us strong soon. 7NT was away from the set most of the month on business.

Traffic: 7PU 314, 7DD 51, 7AAT 17.

PACIFIC DIVISION

SECTION 4, NO. CALIF.—SCM, F. J. Quement, 6NX—The new ORS certificates will soon be mailed to all active reporting stations. Several stations are going to lose their ORS if they do not report this month. 6BMW was high traffic this month, nosing out 6AMM by ten messages. 6BWM was QSO WNP on August 6. 6BVY sent out 50 O-O cards in twenty days besides keeping schedule with pi1AU. 6ZAT had his portable working at Boy Scout Camp, while 6CKV did some fine work with his portable call, 6COI at Capitola. 6CJD built a portable this month and will take it on his vacation. 6BLT worked NZ with his portable. 6AMM kept schedules with KFUH and 6XK as well as handling traffic with J1TS. 6CDW is a new station and will soon be ORS according to the good work being done. 6CIS is using a 301A of 1922 vintage for transmitter. 6CEI had some hard luck trying to get proper juice. 6CLP with 80 watts input, using 5th harmonic, works HU with ease. 6DEK handled his usual amount of traffic and is on consistently. 6AFI is a new station in San Mateo whose QRH is 80 meters, 7.5 watter. Glad to QSO. 6HC, 6CKV and 6APS left on a trip through Oregon and Washington on Aug. 28 to help advertise the Pacific Division Convention held in San Jose, Oct. 15-16-17. FB! 6NX is still OR D'Combat with a power leak, but Convention business has made it almost impossible to pound the key.

Traffic: 6AMM 46, 6BMW 36, 6BVY 26, 6ZAT 22, 6CDW 21, 6DEK 19, 6CLP 15, 6BLT 9, 6CKV 9, 6NX 7, 6CIS 2, 6CEI 1, 6CJD 1.

Sect. 6, No. Calif.—SCM, St. Clair Adams, 6BAF—6BAF is now assistant op at a new broadcasting station just opened at Eureka. As so few reports reached the SCM this month, a move to combine Section 5 and Section 6 is being considered. Please let's have all the reports promptly next month, OMs.

SOUTHERN SECTION—SCM, L. E. Smith, 6BUR—Hot weather here has had no effect upon amateur activity. Traffic is as heavy as winter time and working the other side of the globe, So. Africa, is a common thing. The first amateur picnic was held during the first of the month, and on Sept. 1 another ARRL banquet was held in Los Angeles. Both affairs were attended by nearly seventy hams. The SCM is extremely proud of the traffic record the Section is making, this being due, of course, to the real live wire ORS we have.

Activity around San Diego is showing great increase, a bunch of the San Diego hams planning to go to the Pacific Division Convention in airplanes. Congrats! 6AJM had the great misfortune of losing his father. He is now back in Lemon Grove. 6BAS has just finished his crystal control outfit. The grid and plate in 6SB's 50 united so now he uses a 199. As usual, 6BQ leads his district with traffic. He is now an Official Observer. 6MB blew his 500 watt tube so now uses an A tube. Hi. Any difference, OM? A

real filter now gives 6CGC pure DC. 6AOY is very active with his ½ KW outfit.

District No. 2 had the honor of having Miss 7SI spend the summer here. She has created quite a stir in ham social circles (?) and the entire district has done its best to show her a good time. 6OR, a new ORS, reports working VYG while at Prince Edw. Island. 6CGK says that finances and a YL kept him off the air. Just how do you mean that, OM? 6AKW reports that he is going to fire up his fifty soon. Attaboy. 6DEG is one of our new ORS and is sure a live wire. 6BH is experimenting with antennas. 6BXD made the BPL by a big margin this month. Keep it up, OM. 6AHP was home but one week but sure did his bit. 6BHI now has a 199 running on 5 meters. Give him a listen. 6DAJ reports an increase in DX. KFYF keeps 6CDY busy 7 days a week, so he doesn't get to see his key often. 6DS is handling air mail traffic daily on schedule. Fine work. Schedules make it easy for 6NP to make a traffic total. 6DDC has been working Borneo and PI. 6BJX continues with his big traffic total but missed the lead by 6 msgs. He says QSO with So. Africa is very easy now. FB. 6BGV uses an Aluminum cone filled with water on top of his antenna and works So. Africa. How cum? 6CAE is leaving for Stanford. 6BXC wants HU traffic. He works schedules with Hu every night. He leads the entire Section in traffic. Very FB! 6BVO reports training a new ham. We need him. 6BTM, 6RF and 6CDK all report QRM from vacations. 6CNK and 6OP are all torn up experimenting. 6CQA says messages are scarce but sure originated his share. 6CT is now heard with 6BUR's old sync. 6CLK works Java on a 7.5 watter. 6BBQ is now keeping schedules with Japan. 6AE is looking for schedules. 6IH is another lucky one in working S. Africa. 6CMQ has suffered from YLs this summer, speaking of radio. Hi!

Activity in Dist. No. 3 picked up by leaps and bounds, thanks to the Route Manager, 6BAV. He promises that some more of the old timers will soon be back. FB. 6ASV is working As and Zs. 6ZBJ up in Santa Barbara handled traffic for the yacht Poinsettia during the race.. 6ALR keeps up his good work. A 7.5 watter got 6BVM into S. A. He worked O-A3B. 6AKZ is moving to San Diego in a few weeks. 6BSN reported thru 6ZBJ. He has just moved to Santa Barbara.

6AWQ is trying his best to work J-ITS. He wants to get the OW interested but can't seem to do it. 6DCK, with his UX210, is doing FB. 6CIW, a new ham, is sitting up nights learning the dots and dashes so that he can work Hu 6BUC with ease. 6CKU can't seem to get out. 6CUP is trying to get his heap to oscillate on 40. He has been up on 80 meters fone and doing FB. 6CRZ has been doing pretty good work with a UX210.

Arizona—Dan Lamb, 6ANO, is the new Route Manager here. Summer will soon be over and with it Ariz. static. We hope for some more big traffic totals like we had last year. 6CUW spent his vacation in Texas where he visited many hams. 6BWH and 6CBJ are doing fine work with 50s. 6DCQ continues to work foreign stations on a 7.5 watter. He promises dope on his set in *QST* soon. 6BWS is having lots of fun trying to drill glass panels. He's only a dozen so far. Perhaps you'll make a record, OM. 6ASA is an old timer on with a 5er doing great work. 6ANO keeps going but is very busy with business. He says that they are looking for a real ham year this winter. Fine, OM. 6BJI is installing a UX210.

Traffic: 6BXC 337, 6BJX 328, 6BXD 176, 6BQ 175, 6BBQ 142, 6BVG 123, 6DS 80, 6NP 73, 6CQA 73, 6DDO 49, 6OR 47, 6CLK 44, 6CAE 42, 6AHP 41, 6AE 36, 6BTM 34, 6BAV 32, 6CUW 32, 6BVO 28, 6CT 28, 6ANO 26, 6BVM 25, 6SB 25, 6ZBJ 23, 6DCQ 20, 6CGC 20, 6CSW 20, 6MB 18, 6BH 18, 6ALR 18, 6DEG 15, 6IH 12, 6BHI 11, 6AOY 9, 6CMQ 8, 6DAJ 6, 6BUX 5, 6DCK 4, 6ASV 4, 6CDY 2, 6NW 2.

NEVADA—SCM, C. B. Newcombe, 6UO—Nevada hopes to have at least three hams at the San Jose Convention to represent the Section. Nevada's SCM is looking forward to the first opportunity to see the gang there.

Traffic: 6UO 62.

HAWAII—SCM, K. A. Cantin, 6TQ—Summer weather failed to affect the activities and traffic totals for the past month and local stations made an effort to prove that OM Summer does not affect the 40 meter traffic band. 6AXW leads in traffic work and made the grade to the Brass Pounders' League. Schedules did the trick. 6BUC has established a weekly schedule with pi-1HR. Each of the six operators that stand watch arrange their schedules and this method has greatly improved traffic work. 6AJL established contact with pi-WUCB, John Hay Radio Camp, near Manila. Also stretched his East traffic work by QSOing u-1QZ, Bakers' Isle off New England Coast. 6BDL changed his plate supply from raw AC to DC generator and now works the East coast with ease. Traffic is also handled with the Philippines. 6AFF was on the air again for a month with his new 250 watter. Regret to say that 6AFF plans to sell out and try to keep away from radio. "Is easier said than done, OM." 6NL has a schedule with u-6NP and 6BVG-ex-KFHW. His 50 watter does the work of a 250 watt bottle. 6DCU using 7½ watts MG plate supply keeps in contact with 6RW and 6APS. Traffic was handled with u-1AWQ and 2AKV. An 80 word message was handled from pi-1BD. New Zealand and Australia also accept traffic from 6DUC. 6TQ continues to keep in contact and arrange schedules with the sixth district. A schedule was kept with u-6JP but the last time both were QSO, 6JP had to run for water to extinguish a fire in his plate transformer. That was the last heard from 6JP.

6CFN dismantled his 50 and 250 watter as he is returning to the mainland. Using a 5 watter until he sails. 6AJE turned in his ORS appointment. Pressure of business keeps him away from the key. 6BUS reports reception very poor at his location on the other Island. Traffic handled with 9BRC, c5CR and c9CA. 6ASR builds BCL receivers and ham transmitters. His report indicates that he is kept busy. 6CST was QSO with S. Africa O-A6A using a five watter. Power was estimated as an input of 12 watts. Contact was established with pi-1DL. Station is now under reconstruction. An H tube is being installed. 6KQ using 50 watts AC has joined the ranks of Hu-hams. The relief operator at 6CLJ has been kept QRW. 6CLJ is due back from the Orient this month.

Traffic: 6AXW 173, 6BUC 122, 6AJL 63, 6BDL 58, 6AFF 39, 6NL 27, 6DCU 25, 6TQ 22, 6CFN 17, 6AJE 16, 6BUS 10, 6ASR 7, 6CST 4, 6CLJ 2, 6KQ 2.

ROANOKE DIVISION

WEST VIRGINIA—SCM, C. S. Hoffman, 8BSU—QRN and vacations kept the general traffic totals down again this month. Two old timers showed activity—8SP and 8WZ. DX records are lower than usual. 8AMD worked schedules with WVZ, and worked A, Hu, Z, M and BZ. 8BBM experimented with vertical brass-pipe antenna. 8BJG was heard in Australia. 8WZ is on 78 meters and worked 7ZN with 5 watts. 8SP's QRH is now 40. 8AWV using a 201 tube, worked 7LY. 8CDV worked f8YOR and f8GPL. 8CEK handled a PRR message for Wheeling. 8BSU is busy getting ready to issue new ORS certificates. 8BUB and 8ADI of Wheeling; 8BTB of Hinton have applied for ORS. 8AUL worked c8AF and CZ-FR 5.

Traffic: 8AMD 65, 8CEK 32, 8BSU 20, 8SP 19, 8CDV 16, 8BBM 6, 8BJG 6, 8WZ 6, 8AUL 60.

VIRGINIA—SCM, J. F. Wohlford, 3CA—3TI advises that he is moving into North Carolina and his call will be 4AB. 3MK has had trouble with his receiver. 3AJT is the only station on and did very little. 3BMN has been doing some work with 70 watts input. He works A and Z. He says he expects to rush right on the air in great shape as soon as the weather settles. 3AOT purchased 3AUU's transmitter and expects to be on shortly. 3BZ says nothing out of the ordinary to report. 3CKL has returned from training camp. 3AAI says it's too hot for work right now. 3BGS says other duties interfere with his radio work.

Traffic: 3TI 3, 3BGS 3.

NORTH CAROLINA—SCM, R. S. Morris. 4JR—4RY is helping put Montreal on the map. 4BT shot his fifty but finds that a UX210 is just as good. 4NJ has QRM from golf. 4MI is on most consistently. 4TS is rebuilding and will have some rig-1000 volts storage B, MO-PA set, remote control etc. 4JS handled two messages from VOQ. 4BX is working some DX now. 4PR finds little traffic. 4NH has two UX210s crystal-controlled on 37.5 meters. 4JR has completely rebuilt. 4RI is a new station at Gastonia. 4WE is off the air until school opens Sept. 15th.

Traffic: 4MI 52, 4RY 52, 4NH 19, 4JS 8, 4NJ 5, 4JR 4, 4BX 2.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, C. R. Stedman, 9CAA—Denver: 9CAW leads the Colorado bunch and at the same time wins the first subscription to *QST* given by 8AX. Congratulations, OM. 9DKM runs a pretty close

second to 9CAW. He has made application for ORS. 9CJY put out some good work in between times. He says ND on NZ as yet, tho. Hi. He has a rather important schedule to put into effect soon. 9CJP has just returned from California where he spent two months without seeing a single ham! He says he will have more to report next month. 9DWZ is a newcomer in the reports but promises to be a good station. His QRH is 41 meters. 9DLA is another new station in Denver and hopes to be going soon. 9CNL ditto but he is going fine with a 7.5 watter. 9CUZ will open up as soon as school starts. 9BQO, still another new one, sends his first report in. 9EEA is going fine. 9DED has put in remote control and a Hertz antenna and reports fine results. 9CAA is also using remote control most of the time but is not on the air as much as formerly, as he is working nights now. 9OO has another new 50 and says he gets a better QSB now. 9BJN is rebuilding for a mercury arc rectifier and hopes to have it going full blast PDQ. 9CHV, another new station, is a Western Union op and handles lots of traffic here but reports things slow on the air. 9DQG and 8BJN are both out after the army traffic. 9DQG does most of his work in daylight.

9CDE is working for an Army-Amateur appointment. Good luck to you, OM. He has a schedule with 9EAE every Sunday. 9CFY is back on with AC on the plate.

Traffic: 9CAW 396, 9DKM 281, 9CJY 96, 9CAA 93, 9DQG 52, 9OO 25, 9BQO 11, 9BJN 10, 9DED 10, 9DWZ 5, 9EEA 4, 9CNL 2.

UTAH-WYOMING—SCM, Art Johnson, 6ZT—Only four reports were received from our stations this month. Practically everyone, including the acting SCM, was away on vacations, so there was very little activity.

6 RV with only 13 messages handled more than any other station in the Section. 6BUV reports that he is now obtaining excellent results with a Hertz antenna on 77 meters. 6AIK in Ogden has submitted application for an ORS certificate.

Traffic: 6RV 13, 6BUV 3.

SOUTHEASTERN DIVISION

ALABAMA—SCM,, A. D. Trum, 5AJP—Mobile has a most active ham in the person of Harrison of 5DL. He helped in the installation of the new tube set at WNN as well as the erection of their powerful antenna and counterpoise. 5AX is perking to beat the band, despite an accident recently which nearly cost him his life. One often hears 5MI working. 5AKK is a new ham in Birmingham. 5WI has been working most everywhere with his old trusty fifty and his 100 foot mast raising its towering head to spurt forth the fiery waves coming from the shack. 5DI has played in hard luck so often that he feels like it's natural. Besides blowing an H tube last month, shooting his transformer and then blowing another H tube this month, everything is working at normal. 5AV is building a self-rect. set using 2 H tubes. 5ADA got himself a job this summer so he could have that fifty this winter. 5ATP has been playing around with YLs but is on the air constantly with his fifty, working around the world at his leisure. 5DF has been trying to work on 5 meters. 5AGA is sweating over his Lizzie. 5DF has been at work at 5YB some this summer. 5AJP lost a good fifty last month and is working with a 210 now.

Traffic: 5DI 28, 5AX 24, 5ADA 21, 5ATP 18, 5WI 17, 5AKK 13, 5DF 9, 5AFS 9, 5AJP 7, 5AWF 2.

FLORIDA—SCM, W. F. Grogan, 4GY—We have with us ex-1HE-1ZY who was accused of being a newcomer. He is in Jacksonville with 4MH as a call. Welcome, OM. 1BFI is also with us in Jacksonville. His call is 4KV, and he comes from QST town. Welcome, OM. 4NE is confined to his bed. 4OB has been sick with pneumonia but able to be out now. Most of the gang are away on the Naval Cruise. 4HY and 4DD have been appointed ORS. They are hard workers, and moving traffic well. 4MS reports things are moving slow in Pensacola. YLs probably are the cause. 4TK reports very little traffic moving now. 4JZ is pounding the brass again. 4VS says his new job works him until midnight and on Sundays. 4HX lost an H tube but has another on the way and is putting in crystal-control soon. 4IY is anxiously awaiting a new motor-generator set. 4BL is operating on SS Sheadle on Lake Michigan but will be on at 4BL by Christmas time. 4IZ visited HQ a short time ago when he was in New York on a business trip.

Traffic: 4IZ 89, 4OB 39, 4DD 32, 4HX 30, 4TK 20, 4JZ 10, 4VS 6, 4QY 5.

WEST GULF DIVISION

OKLAHOMA—SCM, K. M. Ehret, 5APG—5ADO just completed his best traffic month with a newly installed 7½ watter with which he works Aussies and N. Z. nearly every morning. The rest of the Cushing gang had better get busy. 5ASK is going away to college but is not going to be beat out of his radio for he has built a portable transmitter and receiver, using 375 volts on a Raytheon tube with a well-filtered output. He reports some good work with this set and is applying for an ORS. 5ANL just moved into his new shack and is about ready to let loose the fireworks. He will be on 80 meters and a little later try 40 with another transmitter. He desires reliable ORS to write him for schedules. (Better get one with the SCM, OM). He is trying to work out a traffic route to handle messages locally in the state. He hints that he will probably have an assistant op with him soon. (Another job for the preacher?)

5SW and 5APG have been contemplating the construction of M. O's with the result 5APG is fairly under way with his. 5QL is still hungry for greater DX and is having a regular diet of this sort. He keeps some sort of schedule with LW who is enroute to Buenos Aires. 5ZAV has his new CW installed in an apartment and is proceeding to erect a station. 5AAV got back from his trip and found that somebody sat on his 7½ watter while he was gone. 5AHR is on occasionally. New 5AGN has been working his station and will start at State University next month. 5AQW bids the Oklahoma Gang farewell and is on his way to California. (Best of luck, OM). We note also that old post war spark, 5HL has left for California. 5ABO is having a time getting a reply out of New Orleans regarding the renewal of his license.

GOOD NEWS, Gang—we just received a letter from Mr. Hebert, Treasurer and Field Man of the ARRL, advising that he will be in Oklahoma City on Monday, November 8. What are we going to plan? Fellows, we have more reports due than we have been receiving. No matter whether you are an ORS or not, loosen up and let's make Oklahoma the best ARRL state in the country.

Traffic: 5ADO 105, 5APG 15, 5AGN 15, 5ANI 10, 5SW 6, 5ASK 6, 5QI 4.

SOUTHERN TEXAS—SCM, E. A. Sahm, 5YK—This Section is rapidly coming forward. Some new ORS have been added and the old ones have taken new life. Present indications are that we will have a splendid winter season. Sharp and Anderson, 5AVI and 5ARF of Uvalde, a new ORS reports working CH-2AR. They report some traffic although they say that they had made little effort to get any before they were an ORS. Witting, 5HE of San Antonio, has come forward as one of our very best stations. He has worked PI, CH, A and Z stations. He relayed trans-Pacific tests and moved a message from San Antonio to the Philippines almost immediately for an Army officer. 5APM reports poor results due to antenna trouble. 5MS has had trouble with fluctuating power supply due to remodelling of their power plant. Edward Wilkins of Mirando City has had some transmitter trouble and is putting in an Esco motor-generator. 5HS is preparing to move and is out of the air for a short period. The Hamfest of the Bexar County Radio Assn. was a huge success and the SCM had a very pleasant time there. Congratulations, the affair was put over in grand style.

Traffic: 5HE 14, 5EW 13, 5MS 12, 5AVI-5ARF 6.

NORTHERN TEXAS—SCM, W. B. Forrest, 5AJT—Reports are somewhat better this month but with the coming of cold weather, they should be very much better for September. 5NW is operating portable 5MZ at the Corsicana Oil fields and wants to communicate with the gang. 5AMG is hollering for traffic. 5PH, Tyler, is now OWLS No. 69 and is prepared to work on 81.3, 40.65 and 20.375 meters, using cyrstal control set. 5AMZ, Mineral Wells, is operating on 176 meters. 5SP is still repairing the station. 5HY says, "Would like some snappy QSOs with the gang who like to QSR and to QSO." 5ACL continues with the good work, although his Mg went west. He is using RAC now. He is on 20 and 40 meters and the best DX for the month was EI-PK7 (Java). 5AJJ, Dallas, blew his WE 50 watter but is now using an H tube on 40 meters. 5QY has been sick the last month but will be ready to go again by the middle of September and wishes to take a bunch of schedules after that date. His address is 1609 Lenway St., Dallas, Tex. 5QI will be at the A. & M. again this year. E. C Shaw,

Ft. Worth is now 5APE and claims he doesn't swing by his tail. He is using a portable with Hertz. 5SF. whom old timers will remember as one of the boys who worked HU6ZAC, from Ft. Worth, on 198 meters in the old spark days, threatens to break loose again. 5AKL, Waco, is active there now and sends in news of the rest of the gang. 5SD is on ship doing 'op' job. 5ATX is waiting for winter weather and the rest of them are just temporarily off the air.

Traffic: 5HY 28, 5AJJ 14, 5ACL, 7, 5QY 7, 5AKG 7, 5AMZ 5, 5PH 3, 5AMG 3, 5APE 2.

CANADA

MARITIME DIVISION

NEW BRUNSWICK—SCM, T. B. Lacey, 1EI—Holidays have rather played havoc with reports but the traffic report still shows a good number of messages coming through from some stations, notably 1AI and 1AQ. 1MD is still on holidays.

Traffic: 1AI 20, 1AQ 15, 1AD 15, 1AK 11, 1AM 10, 1AF 7, 1AN 4.

PRINCE EDWARD ISLAND—SCM, W.A. Hyndam 1BZ—1BZ reports station off the air due to holidays. Only station busy during the month was 1CO who has been doing good work including several messages both ways through WNP in Labrador. 1BZ promises things will be livelier immediately.

Traffic: 1CO 26.

NOVA SCOTIA—SCM, W. C. Borrett, 1DD—1OA, our newest station in Glace Bay, is now on the air and has been QSO several USA stations. 1DM is now rebuilding trying to make his set look like the pictures in *QST*. 1ED entertained the Cape Breton gang this month and is trying to stir uup some new interest. 1AE and 1BF are about ready to burst forth. 1CX, the old reliable, is on practically every night. 1DD has been rounding up new material and has obtained ten new members for ARRL in Halifax which looks good for the coming fall DX work. 1AR, as usual, is pounding out a wicked signal on the 40 meter band. It seems almost impossible to raise any of the gang on our special wave band 52 meters lately. Will all the gang please try and use this wave more, and at least listen up there when calling on the 40 meter band. CHNS, the Halifax broadcast station, is starting a class for those who would like to become hams and should produce the much needed results. Will all Nova Scotia stations PLEASE report by the 20th of each month?

ALSO don't forget your traffic figures.

Traffic: 1CX 8, 1DD 4.

ONTARIO DIVISION

ONTARIO—SCM, W. Y. Sloan, 9BJ—CENTRAL DISTRICT: There has been a little more activity on the part of some of the gang who are back from their holidays but several others are away but it is expected that after the annual 9BJ hamfest at Hanlans Point on the 29th that the gang will be pepped up enough to tear into the fall season for a real good winter.

9AL is back now and had the misfortune to "blow" his generator but after fighting a sync for a week much to the display of neighboring BCLS he has decided to use 300 volts DC (?) from his B eliminator on a 210. He has a schedule with g6MU on the latter's return trip to Europe commencing Aug 22 on 42m. Also he is giving the BCLs a treat for a couple of weeks by announcing from CKNC. 9BJ is still tickling the ether with 150 volts on a 201A and having quite fair results so far. He is going to add another 100 volts this week and hopes to work all he hears. 3EL is at present away for two weeks but did a lot of work in the early part of the month handling 26 messages and working over 200 stations in the month on a sweating fiver with a Hertfi. 3AZ is also away for two weeks and has a portable outfit with him which he expects to keep hot at Balsam Lake. 3CK is just back from his holidays and hopes to put a new feeder line on the old Hertz. 3BY is hard at it again and also contemplating the same change as 3CK due to hard boiled BCLs in the same block.

3BL is experimenting with the new types of feeder lines for Hertz antennas and hopes to be on with added power soon. 3VH writes from Bermuda to say that it is a Ham's paradise for signals until the moisture (?) which is quite abundant there gets at the transformers and fones. 3FC having been very busy making a business of radio, has had very little time to work the set. When on the air, the Pacific Coast was worked several times in early evenings. He has also managed to be on 52.5 all along every Wednesday night. 3FC will start rebuilding soon and hopes to be crystal controlled soon on 39 meters.

3CC reports that things are humming in the little Northern town now since the new radio factory was started and reports 3 new hams in the making. 3CR was pounding away with 90 volts on a Northern Peanut and working 2's and 3's galore until one day he got too ambitious for higher power with resultant loss of said tube. He will use real high power this winter in the form of a fiver or 210

3BT of Hamilton reports that he has purchased two fifties 203A's and he expects to have them on the air soon after the Hamfest which he will attend. He is going to use S tubes for rectification and he wants a "HE" transformer. He says that he has worked most of the US Districts on his low power set.

9AI has been reported heard in daylight in England and Bermuda on 37.6 meters using 170 watts input to a 204A tube. Was also copied solid for two hours 11 feet from the fones in Brooklyn, N. Y. at midday on same wave.

Northern District—3HP reports that he is preparing for a big winter.

Southern District—Things are slowing up in St. Catherines and 3MF is left to keep the home fires burning. 3ACO promises some real activity from his section on the Division. A live wire radio club is pepping things up. 3ABG is selling out. 3IA is going to operate a set at the Western Fair and will handle traffic. Good Biz.

Traffic: 3HP 12, 3EL-26, 9AL 12, 3BY 16, 3FC 5, 9AI 10.

QUEBEC DIVISION

QUEBEC—SCM, Alex Reid, 3BE—It seems almost impossible to get the gang on the air though radio conditions were never better. Listen any evening and you will hear a bunch of foreigners, as well as the expeditions VOQ, WNP, VYG and so on. 2BB, 2CG, 2AX and 2BE are the only stations that have been at all active during the summer months. The Division expects to have a booth at the coming Radio Show to be held in Montreal during October. 2DO and 2BG are building a new fifty watt transmitter. Both will use 50 watters. 2CC had perfect contact with the SS Boethic, only missing her five nights and that was on account of bad QRN. VYG was worked all the way from Sydney to 78 North and return. The Boethic traveled farthest North of any other expedition so far. She returned August 28. 2DM has returned to Montreal and reports ideal conditions, also that the QLC Club has been going very QSA. g2MU from Ireland, was in the City after having carried on tests on the SS Lord Antrim. He visited several of the local stations.

Traffic: 2CG 40, 2BE 4, 2DM 2.

VANALTA DIVISION

VANALTA, SCM, A. H. Asmussen, 4GT—The King-pin slipped out of the machine as for the Vancouver gang, namely 5GO, has left for a visit to China and expects to be back in the spring. He has taken some of his junk with him and hopes to be QSO or at least, log some of the gang enroute and in China. Will your call be on his list when he returns? Buck up there, coast gang, so QST will have a real report from you next month. 5GO, while at camp with a portable xmitter, was QSO a4AN with very small input. 4CL blew up his last 50 watter. Better get a watter cooler OM. We hope you have better luck with your new H tube. 4CS must be busy threshing. If it runs over forty bushels to the acre, no doubt he will put in a 50 watter. 4AX, who once sold his outfit, is back on the air, we hope for keeps. 4AL has a new set on the air looking for traffic. 4AF, working on 40 and 80, specializes in tourists' messages. While at Sarcee Military Camp, he held an informal ham convention, one U being present. Between schedules he spends his time making BUG keys from spikes, FORD coils and hay-wire. Hi. 4DQ hears good DX and gets reports from the Aussies. When the local power goes off, she switches to batteries. 4GT is busy changing his QRA so will not be heard for a while. 4IO is still hunting for the third harmonic in his antenna system but managed to handle few messages on 40 meters. 4CC has installed Kenetron rectification and has a nice note QRV for any traffic.

Traffic: 4IO 10, 4GT 6, 4AF 4, 5BF 2, 5AC 2, 4DQ 2.

At last! The long-awaited

Radio Amateur's Handbook

with a

GOLD MINE

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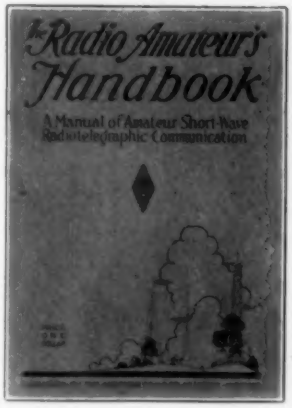

QST page-size, about 160 pp., dark brown cover, gold embossed.

A Manual of Amateur Short-Wave Radiotelegraphic Communication, Written by F. E. Handy, A. R. R. L. Communications Manager, and Published by The American Radio Relay League

THE HANDBOOK meets and fills the long-felt need. It is at once a manual of approved procedure for the most advanced of "old-timers", a text book on station construction and operation for the average amateur, and the finest introduction to amateur radio for the beginning amateur that has ever been published anywhere. It paints the whole picture of the greatest of modern hobbies, covering everything from so elementary a start as the explanation of what amateur radio is and how to become an amateur, up to the details of construction and operation of the most up-to-date type of amateur transmitter, and the most elusive and complex of traffic-handling procedures. Communications Department questionnaires have shown that the amateur has little idea of how his apparatus works. The Handbook explains it, in "theory" made understandable. Data and complete constructional information on the building of many pieces of apparatus are given.

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1AID	2CLA	4PX	8AMB	9CAG	9PJ
1AMH	2NZ	5JF	8COR	9CYC	9EK
1ANQ	2WC	6ABG	8DJX	9CET	c3AEL
1CKP	3BMN	6AFP	8DJY	9CFU	c5BI
1FI	3QP	6ALR	8UX	9CP	m1AF
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